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# Miller's

# "Boss" Painter's

# Receipt Book.

THIRD AND REVISED EDITION.

By R. C. MILLER,

PRACTICAL PAINTER.

XENIA, OHIO,
Nonpareil Printing Co.,
1882.

# KEY TO RECEIPT BOOK.

| | |
|---|---|
| AC | Alcohol |
| AN | Alum |
| AS | Asphaltum |
| ASL | Air Slaked Lime |
| B | Benzine |
| BT | Barytes |
| BO | Boiled Oil |
| BX | Borax |
| CC | Lime |
| CO | Copal |
| CT | Coal Tar |
| CS | Corn Starch |
| CSO | Cotton Seed Oil |
| FO | Fat Oil |
| FR | Flour |
| ES | Epsom Salts |
| EF | Emery Flour |
| G | Glue |
| GC | Gum Camphor |
| GL | Gum Lac |
| GM | Cal. Magnesia |
| IB | Ivory Black |
| LRG | Litharge |
| LP | Lamp Black |
| LR | Red Lead |
| LW | Lime Water |
| M | Manganese |
| MR | Marble Dust |
| NS | Nitrate of Silver |
| PS | Pumice Stone |
| PT | Pine Tar |
| PW | Paris White |
| R | Caoutchouc |
| RN | Rosin |
| RO and RG | Raw Oil |
| RE | Petroleum |
| RS | Roschelle Salts |
| RF | Rice Flour |
| SM | Sweet Milk |
| SO | Soda |
| SF | Sulphate of Lead |
| SC | Salt |
| SH | Shellac |
| ST | Starch |
| SP (page 102 SW) | Spanish Whiting |
| SL | Sugar of Lead |
| SG | Soluble Glass |
| SA | Sal Soda |
| SW | Soft Water |
| TT | Turpentine |
| UB | Ultramarine Blue |
| VS | Varnish |
| WL | White Lead |
| WZ | White Zinc |
| WN | Wood Naptha |
| XX | China Clay |
| YO | Yellow Ochre |
| ZS | Sulphate of Zinc |

# MILLER'S

# "Boss" Painter's

# Receipt Book,

THIRD AND REVISED EDITION.

A Treatise upon the Home Manufacture of Paints, Oils, Varnishes, Dryers, &c.; also, instructions in all the Branches of House, Sign and Carriage Painting, for THE PRACTICAL PAINTER.

By R. C. MILLER,
PRACTICAL PAINTER.

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# PREFACE.

The following pages prepared by the author, have been condensed and again condensed until the author is now satisfied that to meet the demand it is what the Practical Painter wants. The reader has here a complete compendium of the whole work, excepting the Key. He can in a little while become familiar with it, and know exactly where to turn to when in need of advice.

Read the recipes and instructions carefully, and then try them, and you will find that they will work to your advantage; and if at any time you do not fully comprehend them, do not hesitate to write to me and I will take pleasure in answering.

XENIA, OHIO, July 1st, 1882.

### RULES OF PAINTING.

The following general rules in painting may be followed with advantage: (*a*) Let the ground of your work be properly cleaned, prepared and dry. (*b*) See that your colors are equally well ground and duly mixed. (*c*) Do not mix much more nor any less than is necessary for the present job. (*d*) Keep the paint well mixed while the work is going on. (*e*) Have your paint of due thickness, and lay it on equally and evenly. (*f*) Do not apply a succeeding coat of paint before the preceding one is entirely dry. (*g*) Do not use a lighter color over a darker one. (*h*) Do not add dryers to colors long before they are used. (*i*) Avoid using any excess of dryer or a mixture of different sorts. (j) Do not overcharge your brush with paint, nor replenish it before it is sufficiently exhausted. (*k*) Begin with the highest part and proceed downwards with your work. (*l*) Keep your brushes in good condition; do not let them lay out and dry. I

have a trough filled with water that I keep them in. When putting brushes away be careful that the bristles are all straight. (*m*) Keep your pots clean; your ladders, etc., painted.

# Receipts.

## OILS.

### Elastic.

10 gallons B, 5 gallons RO, 2 pounds RN, 1 pound R, 5 lbs. BX, 5 gals. SW, and dissolve the RN and R in 1 gal. of the RO over a slow fire, the R having previously been cut in small pieces. Allow it to stand until it becomes thoroughly dissolved. Also dissolve the BX in the SW; then mix all together, and it will be ready for use.

The BX and SW can be left out if desired.

### Combination Oils for Mixing Paints.

First Kind.—Twelve gallons or one hundred pounds of melted RN, three gallons of crude petroleum oil, fifteen gallons of B.

Second Kind —Twelve gallons or one hundred pounds of melted RN, three gallons of crude petroleum naptha, ten gallons of RO.

Third Kind —For reducing RO or Mixing Paint—one hundred pounds of No. 2 RN,

eighteen gallons best B (or enough to make it work with a brush), two gallons of crude petroleum oil, two gallons of re-run paraffine oil, four gallons of RN oil, or fish oil if RN oil cannot be obtained ; can mix one gallon of this No. 3 kind with one gallon RO, and it it is better than all linseed for outside work. You can depend on the above.

---

**Composition Oil for Mineral Paint.**
**Barns, Fences, Roofs, Iron Work, &c.**

1 bbl. CT, 1 bbl. PT, 1 bbl. B, 50 lbs. ASL, 10 gals. AS; mix cold. In cold weather it will be necessary to use more B than in warm. SW may be added in place of the mineral, which will give a gray.

---

**Adulteration for Oil.**

Fish oil or CSO can be used to adulerate linseed oil.

LW can be used in priming rough work, half and half.

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**Drying Oil.**
**—Equal to Patent Dryer.—**

RO 2 gals., add LR, LRG and umber, of

each 4 oz., and SL and ZS 2 oz. each. Boil slow for 4 hours.

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**Bleaching Oil.**

The painter may do this by simply setting a bottle of oil on the window sash where it will get the sunshine. By artificial methods the oil is subjected to heat, treated with acid, and afterwards washed with steam.

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**Dark Colored Boiled Oil.**

Simmer with frequent stirring, 1 gal. RO with ¾ lb. LRG, powdered, until a skin begins to form, then remove the same and when it has become cold and has settled use off of the top.

---

**Boiled Oil for Clear, White Work.**

Mix 1 part binoxide of M in coarse powder but not dusty with 10 parts of RO. Keep it gently heated and frequently stir for about 20 hours, or until the oil begins to turn a redish color.

## ——PAINTS.——

### Substitute for White Lead.

WZ 75 lbs. dry, MR 30 lbs. Mix well together; run it through the mill, or, if you have no mill, a fine strainer. If you want a clear white or tint job use RO and TT, half and half. For plastered walls (inside) you will find that you will have a much better job than you would by using pure lead, as the work stands out better and finishes like varnished work. If you wish a rough, cheap job, use the elastic oil for first and second coats. The MR can be left out, and PW, XX or BT substituted. Do not put any dryer in until you are ready to use the paint.

SUBSTITUTE FOR WHITE LEAD.—Native barytes, or barium sulphate, is mixed with pulverized stone coal and tar, and exposed to an intense heat, so as to convert it into barium sulphide. The latter being soluble can be dissolved out, and to the clear solution is added a corresponding quantity of zinc chloride in solution. To the solution of barium chloride is

added white vitriol (zinc sulphate), when a precipitate of barium sulphate will be formed, and zinc chloride left in solution, which latter can be filtered and again employed to precipitate barium sulphide.

The two precipitates obtained as above, namely, zinc sulphide and barium sulphate, are well washed, mixed, dried, heated to a cherry red, then thrown into cold water, and finally ground in water and dried. The white pigment thus obtained covers well, and is well suited to mix with oil, as a substitute for lead, especially where sulphur compounds exist or may be generated.

XX will be found to answer. It has a good body and is very durable, either inside or out, but does not do so well on plastered walls as the WZ.

---

**Adulteration for White Lead.**

To 50 lbs. white lead add 25 lbs. WZ dry, and 25 lbs. PW or BT. You will find that the paint will still have a good body and reach as far as 300 lbs. of all pure lead. Mix the WZ and PW (or BT) first and run through the mill

or strainer, then put the lead in after breaking it up; use pure RO and TT for inside work, half and half.

---

**Patent Ready Mixed Paints.**

The ready mixed paints that are now to be seen in the stores for sale, with flashy labels lauding their good qualities, do not contain an ounce of lead and but very little linseed oil. Lead, as all painters know, would go to the bottom, and there form a hard cake in course of time. The principal pigment used in nine-tenths of the so-called patent paints is WZ, XX and PW with umber-black, red, yellow, &c., to give them the proper shade. The vehicle used is the elastic oil. Any practical painter can make this paint at a cost of about thirty-five cents per gallon.

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**A Cheap Paint for Rough Work.**

50 lbs. Mineral Paint—ocher, brown or venetian red, which ever is convenient,—50 lbs. PW and 50 lbs. road dust. Then mix with oil and run through the mill, and if ground fine will do for priming or second coating any kind of outside rough work and is very durable.

By adding ½ bushel of ASL, and thinning with half oil and half sweet milk, you will still have a cheaper paint.

---

**How to Make Oil-Cloth.**

Dissolve GL over the fire in BO till thoroughly dissolved and the BO is brought to the thickness of a balsam. Spread this upon canvas, or any other cloth, so as to drench it and entirely glaze it over. Thus a material will be formed impenetrable by water. The preparation may be used by itself or the different coloring tints added as desired.

A better grade, however, can be made by the following method: First cover the cloth with a paste as follows: Take SP which has been completely cleaned, and mix to a consistency of paste, add dryers enough to dry it, spread over the cloth by means of a spatula. When the first coat is dry a second is applied. The unevenness occasioned by the coarseness of the cloth or the unequal application, are cut down with PS, and when cut down wash off well with water, and after it is dried, a varnish composed of GL dissolved in BO. It will dissolve quick-

ly. Thin with TT and it is ready to apply and the process is complete. Add any color that you wish, or you can grain it if you choose. The above may be used for a table cloth.

---

**Waterproof Cloth.—Elastic.**

3 lbs. RN, 1 lb. R, 4 gals. BO, ½ gal. WN. Dissolve the RN in the BO, and the R after being cut in small pieces in the WN, add Japan enough to dry it. The cloth should previously be soaked in a solution of alum water. If the mixture becomes thick, heat it in a sand bath. It should be applied while warm.

---

**Fire Proof Paint.**

70 lbs. WZ, 30 lbs. ASL, 50 lbs. WL, 10 lbs. ZS. Mix the WZ and ASL together and grind in the elastic oil, then add 1 gal. 35° SG, then the WL and ZS. Stir well. This will make a white paint, and if you wish the color changed add any pigment that you wish to get the shade you desire.

You have enough paint in the above to go about as far as 300 lbs. of pure white lead, at a cost of about one-third.

### Recipe for Luminous Paint.

Sulphide of calcium (Cantons Phosphorus) mixed with any varnish will produce what is known as luminous paint.

Luminous Paint Again.—Take 100 parts of rosin oil, which is to be boiled in a suitable pan with 30 parts of freshly slaked lime, raising the heat by degrees. This mass is at first lumpy, then becomes tougher and afterward passes into a thin liquid. At 300° Fahr. the entire surface of the liquid becomes luminous in the dark. At 380° Fahr. the bluish-white light is very strong in the dark. Objects dipped in the liquid remain luminous for some time.

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### Metalic Enamel Coating.

To make a paint for covering bodies, such as stove pipes, ranges, and other heated surfaces, to produce good work it will be required, first, to coat the object with a covering of the common graphite or black lead. Only such colors can be used as are uneffected by heat, such as burnt umber, burnt sienna, burnt ocher, green earth, and red or violet oxide of iron, best sort

of artificial UB, pure chrome red, chrome green, burnt egg-shell WZ, and the French bronze. All the above can be used, any tint produced by combining them with SO diluted one-half with SW. Bear in mind that it will be necessary to keep stirring them while applying, as they set very quick in the pot, being of a nature similar to Plaster Paris in this respect. The iron should be a little warm so that evaporation may take place at once.

---

**Soluble Glass for Painting.**

Heretofore this substance has been but ittle used for painting purposes, for the reason that when combined with the earth and mineral paints silica is formed, a substance which is almost entirely insoluble. I have been able to prevent this change from taking place by the following process, and it will give you a paint of stony hardness, of great durability, possessing many good qualities in general. I have used it successfully upon mantels. The dry paints should be ground in a size made of starch, (sufficient quantity of the starch being used to prevent its rubbing up.) SP or PW may be used

in place of dry WL and give equally as good results.

First coat the work with 35 per cent. SG thinned down with warm water, let stand one hour or till dry. Then put coat over the work with the water (previously described) until you have a good body, then rub down well with fine sand-paper, then put on a coat of the SG: then the work is complete. Bear in mind the first and last coat must be the SG. You can put up a first-class job in one-half day. Give this a fair trial, and I am confident you will use it continually.

The SG will cost you about 50c. per gallon, then thinned down one-half with water would make the cost 25c. per gallon for your material. Heat will not blister work coated with this preparation.

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**Waterproof Oil Rubber Paint.**

Dissolve 5 lbs. of India rubber in 1 gallon of BO by boiling. If this is too thick reduce with BO; if too thin use more rubber. Especially applicable to cloth, but valuable for any other material.

**Waterproof Rubber Paint for Overcoats, &c.**

Get one worn out rubber boot, put into a kettle with 1 gal. RO. Boil slow until the boot is dissolved. Then strain, add 3 ozs. of black oxide of M. If too thin add more rubber; if too thick add more oil, or you can thin it with TT.

The above can be used in place of R, where it occurs in other receipts. R is very expensive.

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**How to Mix Water with Paint.**

Take SA 3 oz., caustic lime 3 oz., dissolve in one gallon of SW; then stir in gradually ¼ gal. RO; let stand for 3 or 4 days. Take one part of this mixture and mix with two parts of RO. It is now ready for use.

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**Green Paint.**

I. 5 lbs. YO, dry, 1 lb. Orange Chrome, dry; 4 oz. Prussian Blue; grind in oil.

II. 5 lbs. YO, dry; 2 lbs Canary Chrome; 5 lbs. MR; 6 oz. Prussian Blue; grind in oil.

III. 5 lbs. YO, dry; 4 lbs. Orange Chrome; 3 oz. Antwerp Blue; grind in oil. This makes a very clear color, which you can make either light or dark at pleasure. If you wish to make

it lighter add more chrome or YO; if darker add more blue. This receipt is worth its weight in gold, you will find after using it.

| | |
|---|---|
| 5 lbs. YO | 15c. |
| 4 lbs. chrome | 60c. |
| 3 oz. blue | 5c. |
| 1 gal. linseed oil | 75c. |
| Total | $1 55 |
| 16 lbs. emerald green | $4 00 |
| Receipt above | 1 55 |
| Difference in cost | $2 45 |

Use No. 1 for first and second coats, or No. 2 for first and second coat and finish with No. 3. If you have no mill get the colors ready ground in the same proportion as the dry.

### Economy in Making Colors.

PRUSSIAN BLUE.—First. Take nitric acid, any quantity, and as much iron shavings from the lathe as the acid will dissolve; heat the iron as hot as can be handled with the hand, then add it to the acid in small quantities as long as the acid will dissolve it. Second. Take prussate of potash, dissolve it in hot water to make

a strong solution, and mix sufficient of it with the first to give the depth of tint required.

ANOTHER METHOD.—A very passable Prussian blue is made by taking the sulphate of iron (copperas) and prussate of potash, equal parts of each, and dissolve in water, then mixing the two together.

CHROME YELLOW.—First. Take SL and PW, of each 5 lbs., dissolve them in hot water. Second. Take bi-chromate of potash, 6½ ozs., also dissolve it in hot water. Each article to be dissolved separately, then mix all together, putting in the bi-chromate last. Let stand 24 hours and drain off the water. Let it dry and it is ready for use.

CHROME GREEN.—Take PW 6½ lbs., SL and blue vitriol each 3½ lbs., AN 10½ ozs., best soft Prussian blue and chrome yellow of each 3½ lbs. Mix while dry, then add 1 gallon of water, stirring well. Let stand 3 or 4 hours, or until it settles, then drain off the water; let it dry, when it will be ready for use.

A GOOD GREEN.—Take unslacked lime of the best quality, slack it in hot water, then sift it

through a fine sieve, then add a strong solution of AN water. Then color it with bi-chromate of potash and sulphate of copper until the color suits your fancy.

ANOTHER METHOD.—Blue vitriol 5 lbs., SL 6½ lbs., arsenic 2½ lbs., bi-chromate of potash 1½ lbs. Mix dry, then add 3 pts. water; mix well; let stand for 3 or 4 hours, then drain off the water. It is dangerous to handle.

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When any of the above mixtures have stood as mentioned, all that is necessary to drain off the water is to place the preparation into a muslin bag for that purpose, then expose the mixture to the air to dry for use. Glass, stone or wood vessels only should be used, as the acids soon work upon iron, tin or copper, giving a tinge not desired to the color; and also observe that if water is mixed with strong acids it must be added slowly, especially in tight vessels, or you will break the vessels by means of the great heat which is set free by the combination.

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**Adulterations that may be Used in Mixing Paints.**

In case that you have a rough job and want

to get a good body upon it at a small cost, use for the first coat LW, or the contents of the dissolvent keg, adding a little SP, or anything that you may have in the way of a pigment to fill the pores.

Dust of the road is very good after it has been well cleaned. You can carry it right through the 1st, 2d and 3d coats.

To clean the road dust, first get a large tub, fill with water, then put the dust into it, making it about as thick as second coating. Let it stand for a day or two until it is settled. Drain the water off the top, and you will find that the coarse sand is at the bottom and the fine on top, which, after drying, will be ready for use. This has a good body and makes a durable pigment. It can be used to adulterate any dark color.

---

**Paint Skins.—To Save and Reduce to Oil.**

Dissolve Sal Soda, ½ lb., in 1 gallon SW.

The skins that you have can be put into the above. Let stand for 4 or 5 days, then put them into a kettle and boil them, adding sufficient oil to thin to a proper consistency for painting and straining.

### Dissolvent for Paint Skins.

2 lbs. concentrated lye, 5 lbs. unslacked lime to 15 gal. water. Put in the old skins and all the dirty buckets, stir them up occasionally. When the skins are dissolved pour off the lye-water and the paint in the bottom will do for priming rough weather-boarding or brick walls. Do not throw the water away as it will do for another time by adding more lye to it.

### To Soften Putty and Remove Paint.

To destroy paint on old doors, etc., and to soften putty in window frames, so that the glass may be taken out without breakage or cutting, take equal portions of SO and quick lime, and with water mix them into thick paste. Coat the work with this, allowing it to stand about an hour, when it must be thoroughly washed off with water. This is a speedy method of removing old paint, but it must be used with caution. That is to say, the coating must be removed at the instant the solution has taken effect, otherwise the wood will be furred up, and alkali deposited in its fibers to the subsequent detriment of the painting.

### Glass Frosting or Crystalizing.

Dissolve ES in gum-arabic water, let stand over night, and after cleaning the glass off well, flow the solution on so that it will not run; lay the glass flat if convenient, and when it commences to set take a pointed stick and dot it in rows to suit the taste; put the dots about 1½ inches apart. If you wish it colored use analines—red, blue, green and gamboge for yellow or gold color; then flow on a thin coat of Damar varnish and it is finished.

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### Frosting Glass.

The *Scientific American*, of recent date, gives the following method of frosting glass without the use of paint: Clean the glass and moisten it with ordinary hydrofluoric acid. As soon as the frosting is satisfactorily completed wash off with water.

I have not tried the above, but think that it will work.

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### To Pearl or Crystalize Tin.

Take Sulphuric, acid, 4 oz., soft water 2 or 3 oz., according to the strength of the acid, salt, 1 oz. Mix. Heat the tin quite hot over

a stove or heater, then with a sponge wet it with the mixture, washing of directly with clean water. Dry the tin; then varnish with Damar varnish.

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**Permanent Size for Calsomine, &c.**

Dissolve in 20 gals. of boiling water 3 lbs. SA, together with 1 lb. of BX; then add to it, stirring well at the time, 5 lbs. RN having been previously mixed with 2 lbs. B, the whole kept boiling continually till the RN is dissolved. This composition dissolved in the proportion of 1 pound to 30 of water, is to be mixed together with a G solution—made by dissolving 10 pounds of G in 30 pounds of SW—then boil both solutions together for about 10 minutes, then run through a strainer. The above will do for plastered walls that you intend to paint or calsomine.

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**Permanent Size for Wall Paper or Wood that is to be Varnished.**

1 lb. white G, let soak 24 hours in enough SW to cover it, then add 2 gals. boiling SW, 1 pt. WN. Mix well together. This can be relied upon to keep without souring. Com-

mon G will do for rough work. Common starch is a good size for wall paper; also corn starch for fine work.

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**Permanent Paste for Paper Hangers, &c.**

Dissolve 1 oz. of AN in 1 qt. warm SW, when cold add FR to make it about the consistency of cream, then add half thimble of RN, half ounce of SL. The above is the preparation for a bucket of paste

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**Glue, Waterproof.**

Take of gum sanderac and mastic, and white turpentine, of each 1 oz., alcohol, 1 pint. Dissolve the gums in the alcohol, using heat if necessary, then add the turpentine, and have ready a very thick glue, 1 pint, in which there has been added ½ oz. of isinglass dissolved. Make the alcoholic solution boiling hot by having it in a pan inside of a kettle, or another pan of water, then slowly adding the hot glue, stirring constantly until thoroughly mixed. Strain through a cloth. It is to be applied hot. It dries quickly and becomes very hard, and surfaces of wood united with it do not separate when immersed in water. This will do to size

wood that is to be varnished, but will require thinning down when used for that purpose.

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**Lime for Calsomining.**

½ bushel of CC, 1 lb. SC, ½ lb. ZS, 1 gallon SM. For brickwork exposed to damp, the following will be found to work well: ½ pk. of fresh well burnt CC with SW sufficient to make thin paste, run through strainer, add 1 lb. SO, which has been dissolved in boiling water; make a thin paste of 1 lb. of RF, ¼ lb. G, mix with the compound while hot, and add ¼ lb. SA, dissolved in water, stir all together, and let stand for one week, or longer. Warm before using.

The following can be more easily prepared, and is very good:

Take ½ bushel of CC, and put in it a kettle, put water enough in to make a thick paste, add 1 gal. RG, boil well for one hour. Then let it stand over night, or the longer it stands the better. When you wish to use it, take out enough for your job, add glue size enough to give it a body, and also coloring matter to give it any desired tint; apply with calcimine brush.

### Calsomine.

Whiting 4 lbs., glue, 2 lbs Stand the glue in water over night, mix the whiting with cold water and heat the glue until dissolved and pour it into the other, hot. Make of proper consistence to apply with a common whitewash brush.

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### Calsomine, Again.

PW 5 lbs., WZ 3 lbs., Glue 6 ozs. Stand the glue in water over night, or until the glue is dissolved. Do not warm the glue if you can avoid it, but if necessary to save time do not work it while it is warm—put in a lump of ice so as to chill it. This can be made any desired shade or tint by adding any pigment, so that they are fine. Do no not put in the glue size until all the pigments are well broken with water.

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### Whitewash that Will Not Rub Off.

To every pail of whitewash prepared in the ordinary way, add a pint of flour made into starch or paste. To whitewash for the hen-house add gas tar, 1 gill to each pailful. This will prevent or disperse lice.

## —VARNISHES.—

### Caution Respecting the Making of Varnish.

As heat in many cases is necessary to dissolve the gums used. The best way, when practicable, is to use a sand bath, which is simply placing the vessel containing the varnish in another filled with sand and placed on the fire.

### Common Oil Varnish.

RN 3 lbs., drying oil ½ gal. Melt together, and add, when removed from the fire, 2 quarts warm oil of TT.

### Common Turpentine Varnish.

This is merely clear pale RN dissolved in oil of TT, usually 5 lbs. RN to 7 lbs. of TT. This does not require but very little heat.

### Copal Varnish.

15 lbs. pulverized RN dissolved in 1 gall. of drying oil, 1 pt. Japan if the oil does not dry it, 2 galls. B, 1 gall TT, 1 qt. WN. It will be necessary to heat the drying oil to dissolve the

RN. An elastic varnish can be had by adding 3 ozs. of R cut in small pieces and dissolved in RO, by warming. See that it is well dissolved then strain and add to the above.

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**Gloss Varnish.**

Take 1 gall. RO, boil for one hour, then add 4 lbs. RN, stirr till dissolved, add 1 gall. TT, 3 oz. GC, dissolved in 1 pt. of AC.

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**Common Varnish.**

6 lbs. pulverized RN, ½ lb. beeswax, 1½ gall. RO, ¼ lb. M. Boil for one hour, thin with TT or B until warm.

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**Damar Varnish.**

One of the difficulties to overcome in making a clear colorless varnish, is the milky opacity usually present when dissolving the gum in oil of turpentine. This opacity is owing to moisture being present in the gum, and not certain parts of the gum remaining undissolved, as is commonly supposed. The moisture having first been driven off, a clear, colorless solution results. Many of the imperfections of a poor article are owing to the presence of this same

moisture. The cracking is largely owing to this, as little bubbles are often formed, hence the uneven surface. They also cause the varnish to spring. To prove this it is only necessary to procure a small quantity of the best Damar the market affords, add to it one drop of water and it is at once changed to one of inferior grades. The varnish manufactured by the following process the author found to be colorless, perfectly transparent, dries quickly, a high gloss, and will not crack, peel or become tacky. The main object is to remove the moisture. This can be done by evaporating a solution of the gum, or drying it first. To do this a porcelain lined kettle is necessary, in which place the gum and heat over a slow fire. Great care must be taken to keep the gum from taking fire. The author's plan has been to have a cover loosely fitting the kettle, its edges or rim covered with cotton having been saturated to a slight degree with water, and the cover suspended by a cord over the kettle. In case of fire it can be lowered at once and the flame extinguished immediately. In making the varnish five parts of the gum should be taken to

four parts of the oil of tpn., or 85 ozs. of the gum to every four gallons of the oil of tpn.

### Mixture of Varnishes.

When different varnishes are mixed, they should always be allowed to stand for several days before using to give them time to assimilate.

### Good, White, Hard Varnish.

One quart of good AC, 10 ozs. gum sandarac, 2 ozs. gum mastic, ½ oz. of gum anime ; dissolve in a clean can or bottle by shaking often till dissolved, and strain.

### White Hard Varnish.

Dissolve gum anime in nut oil, boil it gently as the gum is added, giving it as much gum as the oil will take up, and while cooling dilute it with pure turpentine; this will do for the ground, also for the japanning for white. It takes some time to harden, but is durable.

### Body Varnish for Coach Painters.

Eight pounds of fine gum anime, two gallons of clarified oil, three gallons of good turpentine, boil slowly for four hours.

## —DRYERS.—

**How to Make and Use Them.**

With respect to drying the well-known additions of sugar of lead, litharge and sulphate of zinc, either mechanically ground or in solution for light colors, and japanner's gold size or oils boiled upon litharge for lakes, or in some cases verdigris and manganese for dark colors, may be resorted to when the colors or vehicles are not of themselves sufficiently good dryers alone, but it requires attention, as an excess of dryers renders oils saponaceous, is inimical to drying and injures the permanent texture of the work. Such colors, however, dry badly from not being sufficiently edulcorated or washed, and many are improved in drying by passing through the fire or by age. Sulphate of zinc as a dryer is less efficient than the acetate of zinc, but is to be preferred with some colors. It is supposed, erroneously, to set the

colors running, which is positively not the case, though it will not retain those disposed to it because it lacks the property which the acetate possesses of gelatinizing the mixture of oil and varnish. These two dryers should not be employed together as frequently directed, as chemical action takes place and two new substances are formed, one of which is perfectly insoluble, and the other poor in its drying properties. The state of the weather and atmosphere exert a great influence upon the drying of paints, oils, etc. The oxygenating power of the direct rays of the sun renders them peculiarly active in drying oils and colors, and was probably resorted to before dryers were thought of. The atmosphere, too, is imbued with the active matter, to which its drying power may be attributed. The ground may also advance or retard drying, because some pigments, united either by mixing or glazing, are either promoted or obstructed by their conjunction. Artificial heat also plays an important part.

The various affinities of pigments occasion each to have its more or less appropriate dryer, and it would be a matter of useful experience

if the habits of every pigment in this respect were ascertained. Dryers of less power than the above, such as the acetate of copper, *massicot*, red lead and the oxides of manganese, to which umber and the cappagh browns owe their drying qualities, and others might come into use in particular cases. Many other accidental circumstances may also effect drying. Dryers should be added to pigments only at the time of using them, because they exercise their drying properties while chemically combining with the oils employed, during which the latter become thick or fatten, and render additional oil and dryer necessary when again used. Acetate of lead dissolved in water, spirits of turpentine, may be used as a dryer of oil paints with convenience and advantage in some cases. In the employment of dryers it will be necessary to guard against the following:

[A.] Not to add dryers to those pigments which dry well of themselves.

[B.] Not to employ them in excess, which only retards the drying.

[C.] Not to add them till the color is to be used.

[D.] Make use of only one kind at a time.

[E.] Impurity of the pigments sometimes retards drying, in which case it should be washed. Another point should be observed and that is, that one coat of paint should be thoroughly dry before another is applied; for if the upper surface of paint dry before the surface beneath, it will shrivel by the expansion and contraction of the under surface as the oil evaporates and dries. Overloading with paint will be attended with the same evil, and if the upper surface be of hard or brittle varnish, cracking of the paint will be the result. Always avoid using old fat paint that is to be varnished over, and always put your dryer into your paint before breaking up or thinning.

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**Drying Property of Linseed Oil.**

The activity (drying power) of pure linseed oil is represented—according to M. Chevreul—by 1,985, and oil treated by manganese with an activity of 4,719, yet when they are mixed the sum of the activities (drying powers) will be 30,828. There are substances which increase the drying property of pure linseed oil,

and others which seem to retard the drying. Experiments made by M. Chevreul elicited the following facts, namely:

"Linseed oil with one coat applied upon glass was dry after 17 days."

"The same oil, mixed with oxide of antimony, took 26 days to dry. In this case, the oxide of antimony was an *anti-dryer*."

"Linseed oil, mixed with oxide of antimony, and applied upon a cloth painted with pure white lead, was dry after 14 days."

"The same oil mixed with the arseniate of protoxide of tin was not hard after 60 days."

"Oak wood appears to possess the anti-drying property to a high degree; poplar to be less anti-drying than oak, and Norway fir less than poplar."

"Experiments proved that a first coat of linseed oil on oak was dry, only on the surface after 32 days; and three coats took 159 days to dry."

"Three coats on poplar wood dried in 27 days, and on Norway fir in 23 days."

"One coat of linseed oil given upon surfaces of copper, brass, zinc, iron, porcelain and glass,

was dry in every case after 48 hours."

M. Chevreul believed that a substance may be drying or anti-drying under different circumstances. He claims that metallic lead is drying toward pure linseed oil; and white lead which is well known as possessing drying properties, is anti-drying towards linseed oil applied upon metallic lead.

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**Japan Dryer—Best Quality.**

RO 1 gal., and put into it ¾ lb SH, ½ lb. LRG, ½ lb. LR, 6 ozs. SL. Boil in the RO until all are dissolved, which will require about 4 hours; remove from the fire, and when very near cool add 1 gal. TT, and stir it up well; then it is done. B can be substituted for TT if you wish.

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**Japan Dryer.**

RO 1 gal., ¾ lb. SH, 2 lbs. M, 1 lb. ZS. Boil about 4 hours, and when very near cool add 1½ gal. B.

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**Japan Dryer.**

9 gals. of RO, 10 lbs. LRG, 10 lbs. LR, 7 lbs. black oxide of M. Boil all together; then

add 30 lbs. of Kowery gum, and when near cool add 35 gals. TT. This is a good dryer and can be depended upon.

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**Japan Flow for Tin and Iron.**

Take gum sandarac 1 lb.; balsam of fir. balsam of tolu, and acetate of lead, of each 2 ozs., and linseed oil ½ pint. Put these into a suitable kettle, over a slow fire at first, then raise to a higher heat until all are melted; now take from the fire, and when a little cool stir in spirits of turpentine, 2 qts., and strain through a fine cloth. This is transparent, but by the following modifications any or all the various colors are made from it.

BLACK.—Melt asphaltum, 2 ozs., in spirits of turpentine, ½ pint, then rub up Prussian blue, ½ oz., with a little of it, mix all well and strain; then add the whole to one pint of the first above.

BLUE.—Take indigo and Prussian blue, both finely pulverized, of each ½ oz., spirits of turpentine 1 pint. Mix well and strain. Add of this to 1 pint of the first until the color suits.

RED.—Take spirits of turpentine ½ pint, add

cochineal ½ oz.; let stand 15 hours, and strain. Add of this to the first to suit the fancy.

YELLOW.—Take 1 oz. of pulverized root of cucuma and stir of it into 1 pint of the first until the color suits; let stand a few hours and strain.

GREEN.—Mix equal parts of the blue and yellow together, then mix with the first until it suits.

ORANGE.—Mix a little of the red with more of the yellow, and the first, as heretofore, until suited.

In this simple way you get all the various colors. Apply with a brush.

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**Varnish for Grate Fronts, &c.**

Asphaltum varnish with enough ivory black in it so that it will cover well. Do not mix more than you wish to use at one time, for when it stands long it does not do so well.

## —FILLERS.—

### Wood Filling.

1 lb. CS, ½ pt. BO, ½ pt. Japan, ½ lb. PS, 1 gill SH varnish, mix well together; for dark wood add a very little burnt umber; thin with B or TT; apply with stiff brush; let it stand till it sets; rub off with Excelsior shavings or rags; get all out of the corners with sticks or putty knife.

I have used this filler for a number of years and can recommend it to the trade. For light woods use more SH varnish and less Japan, unless your Japan is very good.

### A Filler for Porous Hard Woods.

Use good BO and CS stirred into a very thick paste, add a little Japan, then reduce with TT. For dark ash and chestnut, use a little raw sienna; for walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more color than is required to overcome the white appearance

of the starch, unless you wish to stain the wood. This filler is worked with brush and rags in the usual manner.

Let it dry for 48 hours, or until it is in condition to rub down with No. 0 sand-paper without much gumming up, and if an extra fine finish is desired, fill again with same materials, using less oil but more of Japan and TT. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety, by following up the usual methods. This formula is not intended for rosewood, and will not be satisfactory if used therefor.

### A Cheap Filler.

If you have a job that you have to put through in a short time, make a strong size out of common G and common starch, half and half; dust off the work well and size, and when dry rub down with sandpaper, dust off again and it is ready for either varnish or paint.

### A Good Filler.

2 qts. TT, 1 qt. BO, ½ pt. Japan, 1½ lbs.

PS pulverized, 3 lbs. PW, 1 lb. French yellow, 2 lbs. plaster Paris, 1 lb. LRG. This filler is worked with brush, rags, and Excelsior shavings in the usual manner. It must be worked quick as it sets fast. For dark woods add a small quantity of burnt umber and B sienna.

**Putty for Wood that is to be Varnished.**

For puttying inside work, take one-half SW, one-fourth beeswax, one-fourth RN; powder the RN very fine, mix it with the SW, then melt the beeswax in one-half oil and one-half TT, put all together in an old sauce pan and heat gradually, stirring and mix in color; for walnut, match with burnt umber, and burnt sienna, or Venetian red; for light woods, but little if any color but the ingredients. After thoroughly heated and mixed take off and let cool, enough to thicken up for working on a board oiled or covered with whiting, work it into rolls about an inch in diameter; in using have a candle or lamp and round-pointed knife; heat the knife and fill the holes quickly, leaving hole round-full; rub off with a bit of sandpaper. After an hour or two this putty will

match the wood perfectly, and will never swell nor shrink, and after a little practice the work can be done just as quick as with ordinary putty. If you are hurried for time and are obliged to use shellac, use white shellac; this leaves the wood clear and don't have that nasty, sickly look as when brown shellac is used.

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**Putty,**

For ordinary varnished work must be mixed with a little oil and Japan, also add some rubbing varnish. Have it so that it will dry quick. Color it to match the wood. For Pine, chrome yellow, burnt sienna and whiting. Ash,—use the same, except add a little burnt umber. White Walnut,—use the same. Black Walnut,—whiting, burnt umber and black. In using the putty be careful to clean off all the surplus from around the outside; do it with sandpaper or a rag dipped in turps.

## —HARD OIL.—

In 1 gall. RO put 4 ozs. of SH and 2 ozs. of beeswax. Boil slow for about four hours, then let it settle. I sometimes add ¾ lb. of RN, which makes it as heavy as varnish, and if too heavy thin with TT. Work it the same as you would varnish.

### Hard Oil Finish.

There are a number of ways of putting up this kind of work. In the first place fill the wood with the filler, then rub down and putty up, dust off well, then flow on the hard oil, and when dry cut it down with No. 0 sandpaper and flow on another coat. When dry cut it down with pulverized PS and sweet oil. If you wish a polished job flow on another coat, making one of filler and one of hard oil. This last coat must get hard, then polish with rotten stone and BO with woolen rag, and chamois skin to do the cleaning with.

ANOTHER WAY.—Get a good body with

rubbing varnish or common copal; then cut the gloss off with BO and PS. This is the usual way furniture is finished, and is a very cheap way.

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**Hard Wood Finish and Filling.**

Very few persons desire a high gloss on inside work, so there is very little need of varnish for this purpose, still, a high gloss may be used sparingly with a most happy effect—especially in large rooms, on raised mouldings, &c. The finisher, himself, must always be the judge how the work must be done. In kitchens, pantries, &c., where it has to be cleaned often, especial pains should be taken that it be done well, that it may stand the wear. The oil will have to be used principally. Chambers, &c., where greater care is usually taken in the selection of wood, and the surface less exposed to friction, we can leave it, as far as the color is concerned, the same as it is left by the carpenter. The first thing, of course, is the proper preparation of the surface. The surface may be rough and the grain raised by moisture. If such is the case go over it carefully with No.

1½ or 2 sandpaper, taking care always to sandpaper in the direction of the grain. Hammer marks, if found, should be touched a few times with a moist sponge until they come up even with the other surface.

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**Oil Polish on Wood.**

Fill the grain with SH varnish or wood filling; give two or more coats, sand down and apply two or three coats of oil polish; when thoroughly dry rub with tripoli and water until a polish is secured. Again cut the polish with fine PS and water and polish with sweet oil and rotten stone. The French method is to use powdered tripoli and BO to bring up the polish.

## —SLATING FOR BLACKBOARDS.—

There are quite a number of ways of doing this class of work. I find that the great secret in putting up a good blackboard is to use no oil of any description in any of the coats. If it is a plastered or papered wall you wish to slate, first give it a coat of G size, then rub it down lightly with fine sandpaper; then give it a coat of SH varnish and LP enough to give it a fair body. If on wood omit the sizing, but use paint for priming. Then give two coats of either of the following:

*First.* 2 qts. AC, ½ lb. SH, 12 drachms LP, 20 drachms UB, 4 ozs. powdered RS, 6 ozs powdered PS.

*Second.* 1 gal. AC, 1 lb. SH, ½ lb. IB, 5 ozs. of EF, 4 ozs. of UB.

*Third.* Take equal parts of PS and LR and grind them in a mixture of TT and best VS; add enough LP to make a dark color, then thin with TT until it is perfectly flat. Apply with a brush and blend over.

*Fourth.* 1 gal. WN, 1 lb. SH, 4 ozs. LP, 4 ozs. UB, 1½ lbs. SW, 2 ozs. PS and powdered emery. The WN is cheaper than AC and does as well.

*Fifth.* 1 gal. SH varnish, 4 lbs. black M, 2 lbs. SW.

All the above must be kept well stirred while using them, and when you are through put what you have left in a bottle and cork it up, and it will keep for a long time. If at any time the slating is too thick thin with AC.

## —SIGN PAINTERS' DEPARTMENT.—

### To Gild on Glass.

SIZE: Take a piece of isinglass about the size of a twenty-five cent piece, and put in a pint of rain water scalding hot, stir until the isinglass is dissolved, then filter through filter paper; then add one tablespoonful of good whisky; let stand 1 day before using. This size will keep a year in a bottle corked up. It will work much better when it has stood two or three weeks.

Good, clear white G will answer if you have no isinglass.

It is sometimes very covenient for the house painter to know how to do a job of glass gilding, and after a little practice it can be done very successfully by following the directions here given. In the first place good work cannot be done on poor glass. If plate glass cannot be had, then the best French glass should take its place, for to the purity of the glass do we owe the greater part of the brilliancy of the

work. Having secured the glass, proceed to clean it thoroughly with whiting and water, polishing the work-side with tissue paper. Apply the size plentifully to the glass with a clean camels hair spalter, and with a tip throw on leaf somewhat in excess to the space needed for the work, and when this is done let the whole dry, setting it up edgewise. When dry, take refined cotton and rub briskly until the desired lustre is obtained. If most of the leaf has been rubbed away, no matter, the lustre is there. Now lay a second coat in the same manner as the first. When dry go over it again with cotton, lightly, then wash it with sizing repeatedly if a spotless surface is desired. When done it is ready for the design, which must be drawn on paper, pricked and pounced on the gold in a reverse position, for the same is to show from the opposite side of the glass. Having pounced it, proceed to paint out the whole design with drop black in Japan, except such places as may need coloring or to be flatted. Then wash off the surplus gold with water. If the sizing is a little too strong add a trifle of naphtha to the water when washing. Such

places as are to be colored can now be attended to. If flat gold is to form any part, the space left for it is to be laid with ordinary varnish-size and leaf laid in the ordinary manner, which on the opposite side in contrast with that which is burnished will be very dead or flat. Do all shading backwards, and when this is dry all is done and if glass, tools, water and room are clean, a fine job may be expected. Silver leaf is worked the same way.

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**To Gild on Wood, &c.**

First get a good body with flat paint, not less than three coats on wood, or two on tin or iron, rubbed down smooth. If it is a sign you wish to gild avoid laying off with lead pencil, use soft chalk, then brush off with duster.

For size: use old fat linseed oil, the older the better, mixed with orange chrome yellow, put a very little best Japan in it, thin with TT. Let stand 10 hours, or until it is tackey, then gild.

There are various methods practised by painters in laying gold-leaf. The old method required the use of a "Tip," Cushion, and gold

knife. The tip is a camels-hair brush or lifter, made from two layers of pasteboard, between which a small quantity of camels-hair is laid flat and the parts glued together. The cushion is simply a piece of chamois skin stretched tightly over one side of an oblong piece of wood six by eight inches, a layer or two of woolen cloth or of cotton is, however, first fastened to the board. The gold-knife has a long, narrow and flexible blade with wooden handle and is worthless for any other than the purpose intended. The gold-book is held in the left hand and a leaf of the book carefully turned back which exposes a leaf of gold. which is pressed upon the cushion by a dexterous reversal of the hands. Should the leaf wrinkle, a puff of the breath directly from above it, will usually straighten it. Next, with the gold-knife cut the leaf into the widths required for the work, and by means of the tip lift so much as the hairs will cover, and apply to the "size" beginning at the outer end of the hair.

.The tip must be drawn over the hair or beard occasionally in order to cleanse it from small particles of gold, and to slightly grease it.

Ornaments, letters, and scrolls are usually gilt from the book direct. Another mode is to remove the gold-leaf to an empty book the leaves of which have been slightly greased with soap or beeswax, after which the book is cut up into the required widths, and the gold is laid on by exposing and applying it from the cut-pieces.

### Gilding Frames.

This class of work requires more appliances then the general run of house painters have. I use gold laquer and sometimes good coach varnish for size. Bronze may be used with good success by coating over it with clear white SH varnish.

### Flock and Smalt.

If it is a gold sign that you wish to flock or smalt use slow drying colors and very thick, taking care that the color is not fat or greasy, or it will spread and show a rough edge. To flock or smalt other work see that the work is flat where you do not want the flock or smalt to stick.

I would recommend you to make your own smalts. You can do it at a cost of about one

cent a pound. Any good, fine sand will do. See that it is clean, put ½ gallon sand in a kettle, heat it hot; keep stirring until it is dry, then put in about 2 ozs. of mixed color—the color that you wish—(the color should be mixed in good BO,) keep stirring until all the sand is colored even, then spread it out in the sun to dry, stir it up occasionally and it is ready for use. If you wish you can add a small quantity of pulverized glass or glass frosting.

### To Silver on Glass

1. Dissolve 12 grains of RS in boiling water; then add, while boiling, 16 grains of NS, having been previously dissolved in one ounce of water; continue the boiling for ten minutes; then add water to make 12 ounces.

2. Dissolve 1 ounce of NS in 10 ounces of water; then add liquor ammonia until the brown precipitate is nearly, but not quite dissolved; then add 1 ounce alcohol and sufficient water to make 12 ounces.

To silver, take equal parts of Nos. 1 and 2, mix thoroughly, then pour upon the glass in the same manner the photographer applies his

solutions, or it may be applied with a brush. It should be applied to the glass while its surface is wet, and should previously be carefully cleaned with soda and rinsed with clean water. Distilled water should be used for making the solutions. About two drachms of each will silver a plate two inches square. The solution should stand and settle for two or three days before being used; it will keep a long time.

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**Embossing by Brushing out on Glass.**

On the flashed side of the glass, or any side if plain glass, lay a coating of asphaltum mixed with a little red lead. When dry place the stencil plate flat on the glass and with the use of a stencil brush rub a little soap upon the edges of the stencil plate. This will make the stencil air tight and prevent the TT [which is afterwards used] getting under the edges of the plate and leaving a ragged outline. With a similar brush dipped in TT rub off the asphaltum, lift off the stencil and wash away the deposit, left by the soap and TT, in *cold water*. It is now ready for the acid [fluoric acid] to "bite off," when the ornament will have a sharp

clean outline like the stencil. Add 4 ozs. of vitriol to 1 pt. of acid.

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**Best Imitation of Etching.**

Grind sugar of lead in damar varnish with TT to the consistency of cream. Write the word or ornament on the glass, and when set or nearly dry go over with dark gold bronze; when thoroughly dry back with light.

A very pretty sign on glass is got by blending the letters with copper, gold and silver bronzes, and back with some rich color.

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**Gilding on Glass with Silver Leaf.**

The following receipt I give for what it is worth. It is the receipt that an Englishman sold in all the principal cities in the United States. I have never tried it, consequently know nothing about it.

DIRECTIONS FOR GILDING ON GLASS WITH SILVER LEAF.

Dissolve 2 ozs. of bi-chromate of potash in water, and when dry mix with 3 ozs. of spirits of wine until it becomes pulp. Mix the pulp with Damar varnish to the tint of gold required.

Lay this on with a camel hair brush, and *when set or nearly dry* lay on the silver leaf as you would gold leaf. Place the glass side to the front of a fire in the winter, or warm sun in the summer. This will make the spirits of wine in the pulp preparation to expand the silver leaf and take out all the marks of the joinings of of the leaves. Rub the silver side with cotton, wool, or a piece of silk to burnish it. Back the ornament or letters with gold size. The heat having destroyed the varnish through the action of the bi-chromate of potash in the pulp preparation, you can wash away the deposit left by the silver and varnish with a sponge in cold water, when the glass will have all the beauty of gold gilding.

The bi-chromate of potash should be pounded before being dissolved in the water. It will dissolve in 3 or 4 days.

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**Fluoric Acid—How to Make It for Etching.**

Fluoric [sometimes called hydro-fluoric] acid can be made by getting the fluor or Derbyshire spar, pulverizing it and putting it into sulphuric acid, which will eat or dissolve it.

Druggists do not generally keep this acid, but can get it in the principal cities. It costs about 75 cents per ounce, which will be sufficient to do about $50 worth of work. It is put up in gutta-percha or lead bottles, and must be kept in them when not in use. Glass bottles, of course, will not hold it, for it will dissolve glass.

### Glass-Grinding for Transoms, Side Lights, &c.

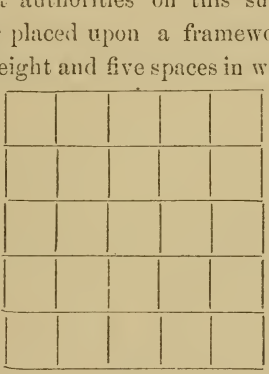
After you have etched the design and wish to show it off to better advantage, take a flat piece of brass and flour of emery and keep it wet. You can grind the light in a very short time. Be sure the glass is laid flat on a level table.

### The Method of Lettering.

#### ROMAN.

This analysis is that of the Roman alphabet proper, usually denominated the Full Roman, and by printers "upper case." It is the most perfectly formed of all the alphabets, making no departure from strictly geometric rules, but adhering in every particular to lines which are either perfect curves or straight lines. Many

Roman alphabets, so called, such as the straight Roman, the New York Roman, etc., are not correctly speaking the true, from the fact that the curves are not perfectly constructed, varying from a true circle. In this analysis we have adopted a method in very general use by the best authorities on this subject, each letter being placed upon a framework of five spaces in height and five spaces in width :



Thus giving to the student a just proportion of the letters as compared one with another, and also enabling him to increase or diminish the size of the squares. By this method the letters can be extended or contracted by changing the proportion of the width of the squares as compared with their height, and the letters can

also be placed at any angle. The working scale or size of square should always be equal to the width of the body or stem of the letter. It will be seen that the letters differ very materially in width, as for instance, A, C, D, G, M, O, Q, R, T, V, Y, Z, and the character &, are all full letters, that is, the the height and width correspond; while in B, F, H, L, N, P, S, U and X, the breadth is 4-5 of the height, and in the W the breadth is greater by 2-5 than the height.

The body of the letter should be 1-5 of its height, except in the curved letters, when it should be widened a trifle, as otherwise it would have the appearance of being thinner, owing to the fact that the space between the curved lines always appears less than that between straight lines. The fine lines should be hair lines, and when a scale of one inch is used, that is, in five inch letters, this line should not be over one line, or $\frac{1}{2}$ inch in size. The width, or spread of the small curves, (sometimes called grace lines) should be $\frac{1}{2}$ the width of the body of the letter, and the spurs should project as much farther, thus together equaling 1-5 of the

height of the letter. In some cases it is necessary to make the curves and spurs at the bottom of the letter a little longer than at the top.

The A is a full letter, the outside oblique lines should be drawn from a point 1-10 of the width of the letter, to the right of the center upon the upper line; the cross line should be a little below the center of the letter; the grace lines and spurs upon the hair line should be made heavier than those upon the body.

The B is a four-fifths letter: the cross line should be placed a trifle above the center, thus making the lower curve a little longer than the upper, and giving the letter stability of form; the curves can be made with compasses, by using the points marked with crosses as centers; the width of the body of the curves should be a trifle more than one-fifth of the height of the letter.

The C is a full letter; the outside line is the circumference of a perfect circle; the inside curve can also be drawn with compasses by changing the center illustrating a crescent. The body of the letter should be a little more than one-fifth of the height, and the heaviest

part should be below the center, the perpendicular line on the head should be a little within the circle, so that the lower part of the letter will appear broader the upper part.

The D is a little less than a full letter; the larger curve is a perfect arc; the inner curve can be made by changing the center and using the same radius as for the outside curve; the body of the curve should be a trifle wider than the upright body.

The E is a four-fifths letter; the lower should be a little longer than the upper; the grace lines of the heads should be long and made with perfect curves; the perpendiculars of the lower head should be extended a little longer than the upper; the center piece should project just one-half of the distance to the outside of the letter, and be placed a little above the center.

The same rules apply to the F, which is a four-fifths letter, with the exception that the perpendicular of the center piece should be a little longer than in the E.

The G is a full letter and the rules for making it are the same as for the C, with the exception that the greatest width of the body

should be directly at the center of the letter; the lower right hand part of should be fully one-fifth of the width of the letter and the horizontal line should be drawn a little below the center, and extend from the center to the same distance outside of the letter as the spurs.

The H is a four-fifths letter; the cross line should be placed above the center, and the lower grace lines should be a trifle longer than the upper.

The I is one-fifth of the height; the lower curves should be a little longer than the upper.

In the proportions of the J authorities differ, some giving it four-fifths, and others three-fifths of its height. In this analysis I give it as a three-fifths letter; the ball is two-fifths of its height, and should be an oval in form.

The K is a full letter; the body is one-fifth of the height. From the upper inside point of the body draw an oblique line to the lower right hand corner of fifth space; then form a point on the body two-fifths of the height of the letter from the bottom line; draw another oblique line to the upper right hand corner of

the fourth space on the upper line. This will give a correct outline for the K; a more definite undertanding can be had from studying the letter.

The L is a four-fifths letter; the perpendicular line of the arm should be about one-half the height of the letter, the same as in the F.

The M is a full letter. The middle lines should meet the lower line at a point three-fifths of the width from the right hand of the letter; the small curves on the hair line should be heavier than on the other letters.

The N is a four-fifths letter; the grace lines should correspond with those of the M; the left hand one, however, should be a trifle heavier than the right hand.

The O is a full letter, and can be made by following the rules for making the G.

The P is a four-fifths letter. The cross line should be at the center of the height of the letter; the curves can be made with compasses, and the body of the curves should be a little more than one-fifth of the width of the letter.

The Q is a full letter, and is made the same as the O; the tail should extend to the outside

limit of the letter, to the right, and should be at least one-fifth of the height of the letter below the line; and it will be found well not to vary much from the line of beauty in its formation.

The R is made the same as B or P, with the exception that the tail is extended, making it a full letter. The shape of the tail varies with different authorities, either being brought down to a horizontal base and finished with a spur, or curved at the end; in either case the general outline should be the line of beauty.

The S is the most beautiful and the most difficult letter of the alphabet to form correctly; it is a four-fifths letter, and it is formed by two lines of beauty. The upper half should be a little smaller than the lower half. A convenient manner of drafting this letter is as follows: take as centers points three-tenths of the height of the letter, from the left hand upper corner and right hand hand lower corner, describe two circles and connect arcs. This is not absolutely correct, yet it will serve as a guide to untrained hands, and from it can be formed a perfect letter by changing the curves a little.

The T is a full letter. The upright lines should be two-fifths of the height of the letter, and the grace lines should correspond with those of the E and F.

The U is a four-fifths letter. The hair line on the right, with the grace lines corresponding with those in the N. The curves at the bottom are made with a radius of two-fifths of the height of the letter.

The N is a full letter. The hair line, with the grace line, is formed similar to those in the U. The point where the oblique lines meet on the lower line should be equally distant from the outside limits of the width of the letter.

The W occupies more space than any other letter, being a seven-fifths letter. The points on the lower line for the meeting of the oblique lines should be two-fifths of the height of the letter from each side, and the body of the second V should occupy the middle space of the upper line. This can best be understood by studying the plate.

The X is a four-fifths letter, formed simply by an oblique cross. Care should be taken,

however, to have the upper half a little smaller than the lower half.

The Y is a full letter. The upright part of the body should be just one-half the height of the letter, but the point where the hair line connects with the body should be a little above the center of the letter.

The Z is a full letter. The lower arm should occupy the whole width of the letter, but the upper arm should be about one line shorter. The perpendicular lines from the arms should be about two-fifths of the height of the letter, the right hand one being a trifle longer.

The character & occupies a full space. In the form of this character authorities differ very materially. It is an abreviation of the Latin word *Et*, meaning and, and was originally a perfect representation of the letters E and T, but time has changed its form so that its original signification can scarcely be distinguished. The form given here is the most popular as well as the most graceful, and coming nearest the to the original can be made as follows: with a radius equal to a' out three-tenths of the height of the character describe

an arc of three-quarters of a circumference; from the left hand termination of the arc with a loop form a curve ending in an oval, this forms the E; from the other extremity of the arc draw a line of beauty to the upper line of the space, this forms the cross of the T and completes the character. The body of the curve should be one-fifth of the height of the letter.

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LOWER CASE ROMAN.

The small class or lower case Roman letters are not so universally employed by sign-writers as the capitals, yet there are times when a knowledge of their forms and proportions is very important, especially with designers and draftsmen.

Painters vary considerably in forming these letters, yet the proportion of the width to the height should always be preserved, in order to form well balanced and graceful characters. It will be observed that the proportion of these letters differs a little from that of the capitals. In all of the full space letters: b, c, d, e, g, k, o, p, q, v, y and z, the height is a trifle greater

than the width; the body of the b, d, f, h, k and l extend three spaces above the line, and that of the t two spaces; the body of the g, j, p, q and y, extend three spaces below the line; the m and w are 7-5 space letters. The body of each letter should be 1-5 of the height of the letter. The f, j and r are 3-5 space letters, and the l and i 1-5 space letters.

The curve of all the letters with the exception of those of the a, lower part of the g, and the s, can be made with the compasses. The spurs should extend at least 1-10 of the height of the letters; the small curves or grace lines may be used or not, as taste dictates.

The capital diphthongal characters Æ and Œ occupy an 8-5 space each, and are made according to the rules for the capitals, except that the body of the F is incorporated as a 1-5 part of the A and O. The lower case diphthongal characters also follow the rules for the small letters, the character æ occupying an 8-5 space, and the œ a 9-5 space.

In addition to the Full Roman there are other forms of the Roman letter, among which a few of the most popular are, the Straight Ro

man, New York Roman, Italic and Antique or old style. It will be needless to give a full analytical plate of each of these forms, as the analysis of the Full Roman will answer as a guide for their construction.

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### THE STRAIGHT ROMAN

Differs from the Full Roman from the fact that the outlines of the body of the letters are straight lines—the small curves or grace lines which characterize and beautify the full letter being dispensed with; this letter is also slightly contracted in width, being as a rule about 4-5 of the height. The C, G, K, M, O, Q, T, X and V, should, however, be nearly full space letters, and the W should occupy about a 6-5 space. The lower case letters of this style differ from those already given only from the fact that the grace lines are not used.

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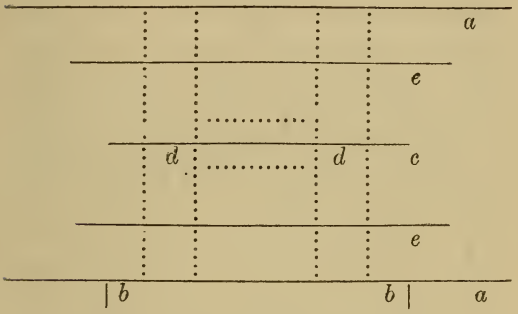
### BLOCKS.

The finished block, either round or square, will be given the same space as the Roman.

The unfinished block will occupy the same space, except the *M, W* and *H,* which will re-

quire one-fifth more space, the / one-half the the space. The rule for the formation of all letters is as follows:

DIAGRAM.




*a a*—Top and bottom lines.

*b b*—The space the letter occupies.

*c* —Center line.

*d d*—Body lines.

*e e*—Used only for block letters.

In laying off work avoid using the lead pencil. I would recommend the use of soft chalk, which can be rubbed off easily when finished.

A good way to space a sign that is to be painted on a brick wall is to follow a mortar joint for top and bottom lines. Count the

number of bricks running through and divide by the number of letters and spaces. For example you wish to paint the word GROCERY. You have here seven letters; give one-half of a space at each end, which would make eight letters and spaces, and the sign is 20 bricks long. The size of the space for each letter would be $2\frac{1}{2}$ bricks, and $1\frac{1}{4}$ brick at each end. The same rule can be observed on board work by measuring the length of the line and dividing into feet and inches.

## —GRAINING.—

One cannot reasonably expect to become proficient in the art of graining save by a regular course of training, under the guidance of a skillful master, but it is within the power of the average painter to perform work of this character that may well pass inspection, when done with care and the observance of a few plain rules, such as I propose offering in this article. In the first place, the amateur must not attempt too much in the way of embellishment or effect, but must confine himself to the execution of a neat, plain and substantial job, taking care to mix his colors properly and to have his groundwork smooth and in good condition for operating upon.

If the woodwork be old painted work, it must be rubbed down with sand paper until smooth and even, all the cracks putied up with hard drying putty [mixed with japan to quick-

en its drying] and a coat of ground color applied. This must be mixed with nearly all turps, as the less oil enters into graining the less will be its liability to crack after being varnished.

The grainer, as a general thing, is never satisfied with any job that he does, but lets it pass because, nine times out of ten, he is not paid sufficiently to justify himself to put in more time on the work, consequently the work is butchered.

The tools necessary to do graining of the various kinds are as follows:

Oak—1 set steel combs.
1 sash tool.
1 rubbing in brush.
Rubber combs to suit fancy.

Walnut, Rosewood, Maple, &c.—
Long hogs hair over-grainer.
Tube camels-hair over-grainer,
Camels hair pencil.
Sponge.
Blender.
Rubbing-in brush and tool.
Stippling brush, (duster will do.)
Flat Fitch.

**Colors.**

Vandyke brown in oil and distemper.

Raw and burnt sienna in oil and distemper.

" " " umber " " "

Lager beer, oil, turps and japan.

ROSEWOOD GROUND.—Do not use lead for priming, use ochre. Second coat, use Venetion red with a little chrome yellow in it, and tolerably flat. Use for last coat, American vermillion with a little chrome yellow in it. Work it almost dead flat. In preparing your ground see that your work is well rubbed and puttied before graining.

GRAIN.—Vandyke brown thinned with lager beer should be used for the over grain. Some use vinegar, but it does not work as well as the beer, and it should be diluted with sugar and water. The growths should be put in with the brown in oil. Use a fitch for the growths; the over grainer and pencil for the grain, which, after it is dry, thin down and put on a glaze over all. Shade as you go. Then varnish when dry.

BLACK WALNUT GROUND.—Mix as near a dove color as you can, as follows: White lead,

chrome yellow, Venetian red, burnt umber, and very little black.

GRAIN.—Stipple with burnt umber 3 parts, raw sienna 1 part, thin with beer. A common duster will do to stipple with. Work in the growths with burnt umber in oil; with pencil blend them out well, and when dry put on thin glaze in oil; add a little raw sienna to the umber. Wipe out with rag. Put in dark, heavy knots with a fitch or small sash tool. It is done by twisting the brush around, and with very little practice is easily done, and sets-off the work to good advantage. When dry varnish.

WHITE WALNUT GROUND.—Dark buff or russet color. Stipple with raw umber in beer. Put in growths with raw umber 3 parts, burnt umber and raw sienna 1 part in oil, and when dry thin down, glaze and shade.

In graining walnut woods, use the flat overgrainer brush and pencils.

ENGLISH WALNUT GROUND.—Very light buff. Stipple with burnt umber in beer. Overgrain with Vandyke brown in oil. Thin down; glaze and shade with the same. Varnish when dry.

OAK GROUND.—Light buff. White lead, chrome yellow and very little Venetian red. Grain with burnt umber, raw sienna and very little burnt sienna in oil and turpentine, half and half; add a little beeswax dissolved in oil. Use the steel comb, and also get a piece of rubber about 4 inches long, 2 inches wide and ¼ inch thick, and cut notches in it about ¼ inch apart. Use the rubber for the heavy growths. After using the rubber, draw the steel comb diagonally across the work Use soft canton flannel over the thumb nail to wipe out the lights, hearts, &c. When dry shade with some color; throw in shades with rubbing-in brush and tool, wipe out with rag. I can give you no designs, but would advise you to study the wood, and do not try to beat the one that made it grow.

PINE GROUND.—Light buff. Grain with burnt sienna in oil.

MAPLE GROUND.—Same as oak. Grain with raw umber in beer. Use the points of your fingers to make the bird eyes, and a flat varnish to make the curls, &c., also, overgrainer to make the growths.

**Stains Graining.**

In addition to the art of imitating the graining of woods, marbles, etc., by oil colors, there are methods of bringing out with effect and beauty, as well as of preserving, the natural graining of woods, etc., and also of imitating, heightening and improving them artificially, though less practiced is not less ingenious or worthy of inattention from the grainer, it being as desirable to heighten and preserve the natural beauty of woodwork as by artificial painting to imitate them or hide their defects. For bringing out the natural grain of woodwork where it is of sufficient beauty, it is enough to apply successive coats of drying oil or to varnish the naked work till it bears out, which is sufficient for ordinary joiner's work, but for the nicer cabinet work, in which the choice ornamental woods are employed, French polishing is necessary, which is performed with a spirit varnish containing lac, applied by rubbers with linseed oil, and is now so common as to have become a distinct business. In other cases graining may be performed on the naked wood with transparent colors in turpentine or

water, which when dry may be varnished or French polished, or the same may be done on the ordinary woods previously stained of the colors of the more valuable sorts. A beautiful variety of graining may be executed with strong acids on plain wood brought out by heat, in which way the nitrous acids or aqua fortis applied affords amber and yellow shades, and the sulphuric acid yields shades of a dusky and darker hue, so as together to imitate the various hues of the tortoise shell, etc., after which the work is to be cleaned off and varnished or polished.

## —STAINS.—

### To Make Red Sanders Stain.

Fill a bottle of any size a little more than one-quarter full of red sanders, then fill the bottle up with AC. The AC extracts the color from the sanders, and the liquid is called sanders stain, or red sanders stain. The more red sanders you put into the bottle the stronger will be the stain, while it can at any time be diluted with AC to make lighter shades. The longer it remains in the bottle the more color will be extracted. Always strain it through a piece of thin muslin before throwing the grounds away. Ask for RED SANDERS at any drug store. It is a red wood dust. Ten cents a pound is what I have been paying at all wholesale druggists. Do not ask for less than half a pound, or you may be charged at a high rate.

### To Mix Sanders Stain with Asphaltum Varnish

If you pour red sanders stain in with asphaltum they will not mix of themselves, but by

adding TT sufficient to thin to a proper consistency, the TT will cause both stains to unite. The sanders give the red shade, and the asphaltum gives the dark—more or less of either will give the required shade according to the strength.

N. B.—The stronger the red sanders stain is made the less of it will be required to give sufficient red, and of course the less AC will be used. It requires very little sanders to get red enough. It is the liquid, not the grounds of the red sanders you mix with the asphaltum. The grounds are, as stated in making sanders stains, thrown away. After mixing these two stains you had better strain it to take the dross from the asphaltum.

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**On Mixing Again.**

Red sanders stain can be mixed with umber ground in oil or turpentine. TT will mix it with all other colors, and it is better and more of a mahogany or rosewood red than all other stains. TT will also mix asphaltum with umber, and make it adhere to the wood better. In fact, a number of practical experiments can

be made with sanders and asphaltum mixed with many other colors, turpentine mixing them either with oils or alcohol colors, and of course with turpentine colors.

### Wood Stains.

LIGHT WOODS TO MAHOGANY.—Mix red sanders stain and asphaltum stain (see mixing stains), and when it is the desired color apply with a brush. Do not have the stain too thick. If the wood is not stained sufficiently red to suit your fancy, you may put red sanders stain into the varnish, and every coat of the stained varnish will make the wood more red. N. B. —The stronger the red sanders stain is made the less it takes to color the varnish. And thus you use less AC which is at present prices the most expensive article you have to get. Thin the varnish when you mix stain with it for first coat; by so doing you can spread the color more evenly (in mixing stains and varnishes).

WALNUT TO LIGHT MAHOGANY.—With either a rag or brush rub over the wood a coloring of red sanders stain, and you have a per-

fect mahogany And by either oil-finishing or varnishing, the color will be brought out. Red sanders stain dries almost immediately, and can be finished right off.

N. B.—Some walnut wood is light, some dark, consequently make the stain strong or weak to suit the wood. You can at any time give more coloring to the wood if necessary by mixing stain with the varnish, even after varnish has been applied to the wood.

Walnut to Dark Mahogany.—First go over the work with asphaltum stain then with the sanders, be sure you do not have the asphaltum too thick or the work will be too dark.

Another Mahogany Stain. — Dragon's blood used the same as red sanders, but it is too expensive and does not stand so well.

Again.—By applying aquafortis diluted with water to dark new woods will make a mahogany, but I don't recommend it, as aquafortis is expensive and dangerous.

To Darken Mahogany.—Use sal soda or lye, but do not have it too strong; dilute it with water. This is to make light mahogany into dark spanish.

**Mixing Stains with Varnishes.**

Red sanders stain and asphaltum stain can be mixed with the varnish. If the varnish is made from turpentine they will mix readily. If made from oil or alcohol, turpentine will cause the asphaltum to mix.

KNOTTY PINE MAHOGANY.—Mix whiting with warm water to consistency of thick whitewash, put in as much Venetian red as will give it a red appearance; now mix in sufficient dissolved glue as will make the mixture adhere to the wood. By giving the wood two coats of this mixture the flaws, knots, etc., will be hidden, and when well dry rub off the loose sizing, then varnish with red sanders stain in the varnish, and you have a very good appearing stain. Brown umber or any colors may be used in the above sizing to suit the fancy for colors, or to darken the mahogany.

WALNUT FOR WHITE WOOD.—A solution of equal parts of permanganate of potash and sulphate of magnesia applied to white wood by means of a brush will produce an excellent brown color resembling walnut. A second

coat may be required after the first coat is dry.

WALNUT AGAIN.—Burned umber, burned sienna and boiled linseed oil ground fine. This is not durable, as the oil or varnish is required to protect it from coming off.

WALNUT AGAIN.—One ounce gum asphaltum, three or four ounces turpentine, one ounce boiled linseed oil, and Venetian red to color red—an old way.

IMITATION BLACK WALNUT.—Poplar or White wood treated as follows will assume the appearance of the finest black walnut. The wood must be dry and warm, and then coated once or twice with a strong aqueous solution of extract of walnut peel. When half dried the wood is brushed with a solution compounded of 1 part y weight of bichromate of potassa in 5 parts of boiling water, and after drying thoroughly is rubbed and polished. The stain penetrates to the depth of from one-twelfth to one-sixth of an inch.

FOR ROSEWOOD.—Dissolve two ounces pulverized extract of logwood in one pint of boiling water (better let it boil till dissolved.) Apply two coats to the wood while hot, and, to

make the rosewood grain, stripe it according to fancy, when dry rub off all the black you can with a rough cloth.

ROSEWOOD AGAIN.—Half pound of red sanders and half pound logwood, boiled in one gallon of water for one hour; strain and add half an ounce of powdered AN; go over the wood with this while hot, and when dry; form dark streaks with logwood without red sanders, boiled in the same proportions. The dark streaks can be made black by adding one-quarter of an ounce of green copperas to the gallon of a pure logwood stain. You can shade the first mixture by proportioning the red sanders and logwood in first stain.

**Beautiful Shades on Light Colored Woods**

Can be made by holding a flat piece of red hot iron close to the wood so as to scorch it irregularly; also, by heating sand as hot as you can and throwing it on the wood in uneven thickness. This will bring out very beautiful shades.

CHERRY.—Rub over the light wood the red sanders stain and it will be a good cherry, bu

do not have the stain too strong or it will be too red.

CHERRY AGAIN.—Boil one ounce annatto in twelve ounces rain water; when the color is well extracted put in a bit of potash the size of two peas, and keep it on the fire a half hour or longer. This raises the grain.

SATIN WOOD.—Can be obtained with very light sanders stains on light woods. It must only be tinged.

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**Stains for Veneers.**

RED.—Brazil wood, fourteen parts; alum four parts, water eighty-five parts. Boil.

BLUE.—Logwood seven parts, blue vitriol one part, water twenty-five parts. Boil.

GREEN.—Verdigris one part, vinegar three parts. Dissolve.

YELLOW.—Fench berries seven parts, water ten parts, alum one part. Boil.

PURPLE.—Logwood eleven parts, alum three parts, water twenty-nine parts. Boil.

Apply the above with a rag, hot, [except the green]. These stains will raise the grain, and must of course be rubbed down before var-

nishing. They will not be suitable to go over old varnish, but are good for new veneers.

Remember This.—It is impossible to give the quantities in many receipts. Sometimes you purchase things with more coloring matter, and less would be required. The liquids are sometimes of a higher proof, and in a thousand and one ways you may go wrong if exact quantities were given. Experiment with a very little, and do not spoil or waste any large quantity. This refers to shades of stains mostly.

Staining Floors, Old or New.—To half a pint of asphaltum varnish add two tablespoonsful of umber (ground in oil); thin this with boiled oil and turpentine (half as much oil as turpentine); then shade with red sanders stain, and by mixing a little turpentine varnish it will wear better. Apply with a brush, not too thick, and mix in a little Japan dryer to dry the varnish.

Orange Stain.—Use vermillion or carmine mixed with chrome yellow, and be sure and have a good full yellow, or it will look poor or watery.

SALMON STAIN.—Dutch pink and red sanders stain.

FLESH COLOR.—Can be made by using different quantities of Dutch pink and red sanders stain.

PURPLE STAIN.—Lake united with Prussian blue or carmine.

PURPLE.—To a pound of good chip logwood put three quarts of water, boil for an hour, then add four ounces of pearlash and two ounces of indigo pounded.

## THE HARMONY AND DISCORD OF COLORS.

Even many calling themselves decorative artists ignore the laws of nature, which control in the matter of harmony and contrast. Practically, they act upon the theory that colors may be arranged in a scheme, with a view to answer the caprice of the artist or his patron. He goes on arranging colors in his work upon the theory or supposition that a certain tint or shade will look well on a given feature or part of his work, without reference to its collocation in regard to other colors. On the contrary, harmony or discord in color depends not on will or caprice or personal taste of anyone, but is based on certain unchangeagle laws. These are a matter of study and experience. By these terms, harmony and discord, we understand colors, placed side by side, will either alter the effect of each other, or completing one

another will heighten the effect of each. Persons familiar with this subject can by so arranging colors or objects of familiar use, with reference to color, in furnishing or fitting up apartments, in dressing, or in decorating walls, as to produce, even with the greatest simplicity, a more agreeable effect than is possible with the most extravagant expenditure, without a sense of harmony and discord.

HARMONY.

RED AND GREEN.—A red body reflects green rays, while, on the other hand, a green body reflects red rays. Therefore, green is the color which completes red, and similarly red is the color which completes green. Both colors, therefore, gain in intensity.

BLUE AND ORANGE.—A blue body often reflects orange rays, and, inversely, an orange body will frequently reflect the blue rays. Orange is, therefore, the complementary color of blue, and *vice versa*; therefore each color intensifies the other.

VIOLET AND GREENISH YELLOW,—A violet body reflects greenish yellow, and, inversely, a

greenish yellow body reflects violet. Both colors, therefore, complete each other and intensify each other.

INDIGO AND YELLOW.—Indigo reflects yellow, and yellow indigo rays, hence they are complementary and intensify each other.

It would carry us too far to describe all the other colors which are complementary

DISCORD OF COLORS.

1. Two simple colors.—RED AND YELLOW. Red appears darker purple, because the indigo rays are imparted to it from the yellow; yellow appears greenish, because green rays are imparted to it from the red.

YELLOW AND BLUE.—Yellow takes away the orange rays from the blue and appears reddish; blue absorbs the indigo rays from the yellow and appears darker.

BLUE AND RED.—Blue appears greenish from the effect of the green rays of the red; red on the contrary, from the orange rays of the blue, appears yellowish.

2. A compound color and a primary color, the latter being contained in the former:—

RED AND ORANGE.—Red absorbs the blue rays from the orange and appears bluish violet; orange is influenced by the green rays of the red, and appears yellowish, i. e., lighter.

RED AND VIOLET.—Red beside violet appears yellower, because it receives the yellow rays from the latter; violet appears darker because greenish rays are absorbed by it.

ORANGE AND YELLOW.—Orange loses from its yellow and appears redder; the yellow appears more greenish.

GREEN AND YELLOW.—Green loses its yellow and appears darker, more blue; the yellow is influenced by the reddish rays of the green and appears reddish, i. e., orange.

GREEN AND BLUE.—The green appears lighter, more yellow, as if it were faded; the blue appears reddish alongside of the blue, i. e., like violet.

VIOLET AND BLUE.—The violet loses its blue and assumes a reddish appearance in comparison with the blue, that is greenish.

3. Two compound colors which have one primary color in common.

ORANGE AND GREEN.—Both colors contain

rays of yellow, and each loses some of its tint by contact, the orange appearing more red, and green more blue.

Green and Violet.—Both of these colors have blue in common, and hence by contact each loses in appearance, the green becoming more blue and the violet more red.

Violet and Orange.—These two colors have the red rays in common, which is lessened by contact, the violet becoming more blue, while the orange appears more yellowish.

Phenomena of Gradual Contrast.

It has been stated in our remarks on the harmony and discord of colors that red reflects green rays, and the green reflects the red rays: that all colors have their completing or complementary shades, which may be observed by the eye. This statement will be confirmed in the following: If one fixes his eyes for some time on a red object, and then quickly looks away or close the eye, it appears just as if the same object apeared before him in green. Similarly a green object, when stared at, produces a red effect when the eye looks away. When one

looks at a blue object for some time there is produced in the eye the sensation as if one saw an orange object, and contrariwise, an orange-colored object appears as if it were blue.

When these colors are seen singly, as for instance, in the form of flowers, or some other ornamentation on a light grey back-ground, and closely watched for some time, it will be found that after a while the grey ground will appear slightly tinged by the complementary color. In the same way with—

| | | | |
|---|---|---|---|
| Red, | the grey ground | is tinged | greenish. |
| Green, | " | " | reddish. |
| Blue, | " | " | orange. |
| Orange, | " | " | bluish. |
| Violet, | " | " | yellowish. |

With wall-papers and woven fabrics these facts have been noticed, and even have led to serious disputes. Thus, for instance, at Paris, in a factory of wall-papers, a case occurred in which a color-mixer was found fault with for having used greenish gray instead of an ash gray as a back-ground for a pattern of red flowers and garlands. His justification how-

ever, was at hand, in the shape of a remnant of the gray pigment, which, when examined by itself, was in reality of ash gray tint. It was Chevreul, the distinguished chemist and director of the Gobelin Manufactory, of Paris, who related the previous case, and the difficulty was settled by his showing that the red flowers imparted the greenish tint to the gray ground.

## COMPOUNDING OF COLORS.

It would be an endless task to enumerate all the colors formed by the mixture of various colors. I give, therefore, the simplest method of making the various tints, leaving the painter to exercise his own judgment as regards others not mentioned. Everyone knows that it would be foolish to attempt to give the exact proportions of the various colors, consequently I will not attempt it, but recommend you to add little by little of the colors until you have the desired shade.

Straw, add chrome yellow to white lead.

Silver Grey, add lamp black and indigo to white lead.

Rose or pink, add carmine or lake to white lead.

Pea Green, add chrome green to "

Lead Color, add lamp black to "

Brilliant Green, add emerald green to "

Bright Green, add Paris green to "

Drab, add umber to white lead.

Buff, add yellow ochre to white lead.

Salmon, add red, umber and yellow to wh. lead.
Flesh, add carmine to straw.
Dark Green, add black to chrome yellow.
Brown, add red to black.
Purple, add red to light blue.
Pearl, add blue to lead color.
Orange, add vermillion to chrome yellow.
Olive, add chrome yellow, blue, black and red.
Chestnut, add white to brown.
Chocolate, add yellow to brown.
Cream, white tinted with red and yellow.
French White, white tinted with purple.
Pearl White, white tinted with blue and purple.
Ashes of Roses, white tinted lead color and lake.
French Gray, white tinted with black and purple.
Russett, yellow ochre and Venetian red.
Stone, Venetian red, lamp black, chrome yellow and white.
Stone, [for inside work,] umber, black, red and white.
Stone, [for rough work,] yellow ochre, brown, black and white.
Peach Blossom, Venetian red and white.

Maroon, yellow ochre, red and white.

DURABLE COLORS FOR OUTSIDE WORK.

| | |
|---|---|
| Venetian Red, | Indian Red, |
| Chrome Green, | Roman Ochre, |
| " Yellow, | Yellow " |
| Prussian Blue, | Oxide of Iron, |
| Antwerp Blue, | Spanish Brown, |
| Intense Blue, | Ivory Black, |

Lamp Black.

Do not use for outside work umber or sienna, as they are transparent colors and will soon lose their brilliancy.

## CARRIAGE MAKERS DEPARTMENT.

The main object to be attained is to get a good foundation to work upon. In working rough stuff carriage painters get too much oil in it, and it does not dry; and when they go to rub it down it rolls up.

### Mixing Rough Stuff.

The methods of mixing rough stuff are as various, almost, as the faces of the painters who are required to mix it. The chief requisite is to select certain coarse gritty pigments, such as yellow ocher, French umber or English filling. Whatever paint is selected, it is of vital importance that the paint should be ground exceedingly fine. The liquids required are confined to japan,, oil, turpentine and varnish, and they must be selected and proportioned according to the time allowed for the rough stuff to harden. Japan hastens, and oil retards the drying. The following recipes have been tested and are known to be good:

1. English filling, 5 lbs.; keg lead, 1 lb.; mixed into a stiff paste with equal parts of either gold size or best brown japan, and three-day rubbing varnish; add a gill of raw oil.

2. Yellow ochre or French umber, 5 lbs.; keg lead. 1½ lbs.; mix stiff in japan and add a gill of raw oil, and a half pint of the bottoms of wearing varnish.

3. Burnt umber 3 parts, silica 2 parts, yellow ochre 1 part; mix stiff in either brown japan or gold size, and bottoms of wearing body varnish.

The above recipes produce tough, durable coatings, but for lightning dryers omit the oil and oil lead.

The carriage painter will save labor by using clean color, varnish and brushes; always strain your color before using; never mix more than is sufficient for immediate use; never draw from the can more varnish than is necessary, and if you have any left do not put it back in the can without straining.

The methods of doing work of this class are various. I will endeavor to explain my meth-

od. First clean off the work; get it free from grease and dust; rub down all rough places; then give it a good coat of rough stuff; let it get dry. Then plaster it well with putty, which is made as follows: If it is an old job, or new, and you have but little time; use SW mixed into a stiff paste with rubbing varnish, with a little good japan, (use no oil). When dry cut it down with sandpaper, then flow on two good coats of flat color, the last coat with a little rubbing varnish in it; then cut it down with PS; then coat with rubbing varnish, with very little color in it; then cut all down until it is level, when it is ready for striping, then flow on the finishing varnish.

### To Mix Striping Colors.

Take one part rubbing varnish, two parts finishing varnish, and one part turpentine. Bottle it up, shake it well, and set away for a few days.

With the exception of lakes which are slow dryers, this vehicle will dry as rapidly as any mixture that can be produced, with the advantage also of free working color. For carmine

and lake add a few drops of japan to the quantity of vehicle required to mix the color. During the summer solstice when the painter is daily called upon to perform miracles almost in "rushing-out" work, the above mixture will be found far superior to the usual one of japan and turpentine.

Quick color should be kept in small pans of tin or stoneware, rather than in a tough mass on a palette-board to be worked down with the pencil. Grind the color to about the consistency required, and keep in a separate pan, turpentine, containing a small proportion of varnish or japan. By this plan dryer is added to each fresh pencilful of color, the pencil behaves better and the stripes run on as freely and with as good edges as when color is mixed with oil. Last, but not least, the color is not so liable to "wash-up" as when japan and turpentine are employed.

## CLASSIFICATION OF PIGMENTS.

The following list of pigments, or paints, comprise about all that are required in Landscape, Portrait, Decorative and Coach painting.

They are alphabetically arranged and assorted according to their colors and hues, and those required by the coach painters are re-arranged by themselves.

### WHITES.

| | |
|---|---|
| Blanc d'Argent, | Silver White, |
| China White, | White Lead, |
| Cremnitz White, | Whiting, |
| Flake White, | Zinc White, French, |
| Nottingham White, | Paris White. |

### YELLOWS.

| | |
|---|---|
| Antimony Yellow; | Indian Yellow, |
| Brandon " | Italian Pink, |
| Brilliant " | Kings Yellow, |
| Cadmium " | Lemon Chrome, |
| Capcine " | Lima Yellow, |

YELLOWS, CONTINUED.

Chrome Yellow, No. 1
" " " 2
" " " 3
" " Light,
" " Med.
" " Deep,
" " French,
Citron "
Dutch Pink,
French Ochre,
Golden Ochre,
Yellow Ochre.
Mars Orange,
Mars Yellow,
Naples Yellow, light,
" deep,
Orpiment,
Orange Chrome,
Oxford Ochre,
Patent Yellow,
Raw Sienna,
Roman Ochre,
Yellow Lake,

REDS.

Amaranda Lake,
Burnt Carmine,
Burnt Roman Ochre,
Brown Red,
Burnt Sienna,
Carmine,
Carmine Lake,
Carmoisen Lake,
Chatemuc "
Crimson Lake, Engl'h,
" " Amer.
Persian Red,
Red Lead,
Rose Lake,
Rose Madder,
Rose Pink,
Royal Red,
Rose Scarlet,
Scarlet Lake, light,
" deep,
Solferino Lake,
Turkey Red,

REDS, CONTINUED.

Florentine Lake, Tuscan Red,
Indian Red, Venetian Red,
Italian Red, Vermilion, American,
Light Red, " Chinese,
Mars Red, " English,
Munich Lake, " French,
Orange Mineral, " Italian,
Orpiment Mineral, " Trieste,
Persian Scarlet, " Zubia.

PURPLES.

Concentrated Purple, Mauve Lake,
English Purple Lake, Purple Madder,
Royal Purple.

GREENS.

Brunswick Green, Pure Green, Light,
Chrome Green, Light, " Medium,
" Med. " Dark,
" Deep, Bronze or Quaker, li'ht,
Emerald Green, " Medium,
Green Lake, " Dark,
Gr'n Ox. of Chromium Sap Green,
Malachite Green, Schweinfurth Green,
Millori Green, Light, Schell Green,
" Dark, Terre Vert,

GREENS, CONTINUED,

Olive Lake,
Paris Green
Veronese Green.
Ultramarine Green,
Verdigris,

BLUES.

Antwerp Blue,
Burnt Prussian Blue,
Blue Verditer,
Celestial Blue,
Chinese Blue,
Cobalt Blue,
Indigo,
Lithographers Blue,
Mars Violet,
Milori Blue,
New Blue,
Permanent Blue,
Prussian Blue,
Ultramarine blue, Fr'h.
" " Ger.
Violet Lake.

BLACKS.

Black Lead,
Blue Black,
Cork Black,
Drop Black,
Ivory Black,
Lamp Black.

BROWNS.

Asphaltum,
Bistre,
Bitumen,
Bone Brown,
Brown Lake,
Brown Madder,
Cappah Brown,
Cologne Earth,
Mars Brown,
Mummy,
Prussian Brown,
Raw Turkey Umber,

BROWNS, CONTINUED.

Brown Pink,
Burnt Turkey Umber,
Caledonian Brown,
Van Dyke Brown,
Verona Brown,
Spanish Brown.

PAINTS AND COLORS USED IN CARRIAGE PAINTING.

China White,
Flake White,
French Zinc,
Silver White,
Whiting,
Brandon Yellow,
Chrome Yel., L. M. D.
Citron Yellow,
Dutch Pink,
Golden Ochre,
Lemon Yellow,
Naples Yellow,
Orange Chrome,
Oxford Ochre,
Patent Yellow,
Raw Italian Sienna,
Yellow Lake,
Yellow Ochre,
Turkey Red,
Tuscan Red,
Venetian Red,
Vermilion, American,
" Chinese,
" English,
" French,
" Trieste,
English Purple Lake,
Mauve Lake,
Royal Purple,
Celestial Blue,
Chinese Blue,
Prussian Blue,
Ultramarine Blue, Fr'h,
Violet Lake,
" German,
Chrome Green, L M.D.

CARRIAGE PAINTS, CONTINUED.

| | |
|---|---|
| Burnt Italian Sienna, | Emerald Green, |
| Carmine, | Malachite Green, |
| Carmine Lake, | Milori Green, L. M. D. |
| Carmoisen Lake, | Olive Lake, |
| Chatemuc " | Pure Green, L. M. D. |
| Crimson Lake, Eng., | Quaker Green, L.M.D. |
| " Amer. | Schweinfurth, |
| Florentine Lake, | Verdigris, |
| Indian Red, | Asphaltum, |
| Munich Lake, | Burnt Umber, |
| Red Lake, | Raw " |
| Rose Pink, | Vandyke Brown, |
| Rose Lake, | Brown Lake, |
| Royal Red, | Drop Black, |
| Scarlet Lake, | Ivory Black, |

Lamp Black.

Closely allied to paints are foliated or leaf metals, and metals in powder or Bronzes. The purest of the foliated metals are termed "leaf," the next grade "half gold," and the inferior kinds are called "metal." Thus we have

| | |
|---|---|
| Gold Leaf, | Half Gold. |
| Silver Leaf, | Dutch Metal, |

French Metal.

BRONZES.—COLORS OF BRONZE.

| | | |
|---|---|---|
| White, | Silver, | Flesh, |
| Light Gold, | Dark Gold, | Rich Gold, |
| Lemon, | Orange, | Fire. |
| Copper, | Carmine, | Crimson, |
| Lilac, | Violet, | Brown, |

Light and Dark Greens.

Gold and silver, however, are the only kinds of value to the carriage painter.

PIGMENTS FOR FILLINGS AND ROUGH COATINGS.

| | |
|---|---|
| Brown Ochre, | Red Lead, |
| Burnt Umber, | White Lead, Wet, |
| English Filling, | " Dry, |
| French Umber, | Whiting, |

Yellow Ochre.

## HOUSE PAINTING.

My book is not intended for the amateur painter, consequently I will not go into all the minor details of how all cases of house-work should be done, but will give some ideas that, perhaps, will be of some benefit to the practical workman. I find, in my experience, that on some jobs it takes more time to get at the work than it does to do it, consequently the painter is obliged to devise speedy ways and means of getting at the work. I will give some of my ways,—they may be old to some, but new to others.

Window sash, sometimes, takes more time than all the balance of the outside work, and in priming, if you take them one by one, it requires considerable labor. A better way is to get two glass-boxes and lay the sash on them, flat, with the munnions down, one on top of the other evenly; put as many on the boxes as you can reach down, and it will be the same as

painting the inside of a box; use a 4-inch flat brush. I sometimes give sash two coats the same way before glazing, which will also save time, and the work does as well if you are careful and do not get the sash dirty while glazing. One good coat will do for the tracing. In painting old sash run around the stiles, letting the tracing go for the first coat; then trace the second coat.

BRACKETS and scroll work should always be primed before they are put up; and you will make time by giving them two coats, using the same color that the work will be finished in; then in the finishing coat you can leave edges.

BLINDS.—If they are pivot or revolving slats lay the blind on the trestle, with the bar down; then paint the top side of the slats; then turn the slat over and paint the other side; then paint the stiles and the edge next to you; then turn the blind over and you will find both sides of the slats painted. Paint the bar, then the edge of the slats; then in next the stile; then the stile; then set it away up end down, and wipe up the other side.

### Swinging Scaffold.

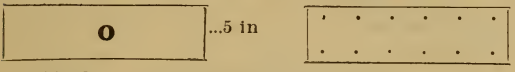
It is a well-known fact that the swing is a great improvement on the old style way of doing work, and for the information of the uninitiated I will give a description of how to rig and work them. A 40-foot fall is enough for doing all ordinary work, unless it be in large cities where buildings are tall, but I will speak of a 40-foot swing. The two ropes should be not less than $\frac{3}{4}$-inch in thickness and 160 feet long, each, with double pulley-blocks above and single blocks below. The stirrup should be made of rope, and I would recommend you to have as little iron about the rigging as possible. A ladder will do for the stage by covering it with boards. There are various modes of rigging on the building. One is the out-rigger, which is used only when the roof is flat. Let the out-rigger (a scantling 3x4 and 16 or 18 ft. long) project over the cornice about 4 ins. and fasten the tackle to it with ropes; some have an iron ring on the out-rigger on which to hook the tackle, but I prefer rope.

For general purposes I find the cornice hooks

the best; they can be rigged the quickest. I have a pair that I have been using for a number of years, and I have not yet found the building that I could not use them on. They are made of $\frac{1}{2}$ by 2 inch wagon tire iron, and bent edgeways, with a hole in the lower end to hook the tackle into. They are large enough to go over a very large cornice, and are shaped something in this style :

The top part is round and sets on a block that has a hole sunk about half an inch in it. The block is 5x16 inches, and $1\frac{1}{2}$ inches in thickness. Pine will do. I use them for working in gutters or on cornices. I also have another set to work on shingle roofs. They are made of hard wood and the same size as the others. On top is the pivot hole, and on the bot-

tom are little spurs to keep them from slipping.




They can be worked on gables, even if the roof be steep, and does not injure the shingles. I also have another set for slate roofs, that have rubber fastened to the bottom of the blocks. They are larger,—10x18 inches.

The swinging scaffold is certainly a great improvement on the ladder mode of getting at the work, and in the eyes of some requires a "sailor" to work it, but I would rather work off of a swing on a building 3 stories high than off of a 16-foot ladder, for there is less danger of getting hurt, and it is not near so tiresome. Two good hands on a swinging scaffold can go over as much surface in a day as four equally good hands can, in the same time, off of ladders. Hands are sometimes apt to become alarmed when doing gables, but if the swing is pulled up well and well braced out from the wall, there is no danger. I have worked a step ladder on the stage to get at the points of gables,

chimneys, &c. Set the foot of the steps as far out on the stage as you can, and lean the top against the wall.

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**Brick Wall Painting.**

New walls should be well rubbed down with a brick and brushed off with a stiff broom the first thing, then it is ready for the

First Coat. Yellow ocher and raw oil, with sufficient dryers to dry it. If the job is to be finished red, add a little Venetian red to the ochre. Do not go over the work again until it is thoroughly dry, which will be in two or three days. Give it more time if you can, because you will save time and material.

Second Coat. Use raw oil and one-third turps if you wish the job to stand out well in the finishing. Some go so far as to say there should be no turps used in any of the coats for outside work, but I differ with them so far as the second coat is concerned. If the wall is to be red use Venetian red, or, if it is to be stone color, mix the color as near what the finish is to be as you can. In this coat you are to do all the puttying-up as you go.

THIRD COAT. Boiled oil and the color the work is to be finished, If red use, Indian red or English Venetian, and if stone color use $\frac{2}{3}$ WZ and $\frac{1}{3}$ WL. The third coat should be worked as stiff as you can conveniently work it.

### Durable Colors for Outside Work.

If I were asked what colors or kinds of paints are best for exterior work, I would say in all cases use such colors as can be made from mineral or earth paints, with as little white lead or zinc as possible. We know that ochres, Venetian reds, metalics, and even whiting will hold to the oil, or the oil will hold to them longer than either lead or zinc when exposed. These, therefore, must be more durable for outside work.

### Flatting Brick Walls.

The painter is sometimes called upon to do work of that description. Coat the wall first and second coat same as previous article on brick wall painting. The "flat" color should be worked very quick, and you must be careful not to leave laps. Two, three, or more men should work together and carry the reaches i

such a manner as to avoid making any laps. "Flat" color is color without gloss, or dead color. If you wish a dead flat use all turps, but that would be hard to work. The "flat" color properly prepared and put on should be applied within a short time after the last oil coat has become dry. This permits the "flatting" to adhere firmly and become a part of the oil-coat, merely deadening the gloss; in this way there is no more danger of the weather having effect upon it than on a gloss, or even so much. The flatting is thus rendered less liable to change in color and more pleasant to the eye, as the roughness and imperfections of the wall are not so conspicuous.

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**Penciling.**

For brick wall. The work should be laid off in half bricks with chalk line, so as to put in the headers on a line, one above the other alternately. To do the aligning the common brick wall lining-brush, which is about 5 inches in length; the brush with which to put in the headers is about 2 inches long; the straight edge, 5 feet in length and 2 inches in width,

and ¼ inch in thickness, with a sharp beveled edge.

Penciling requires no ordinary skill, but oftentimes the boss-painter in small localities is called upon to do work of the kind, and is very often put to his wit's end to know what to do about it. One man in Michigan wrote to me, that he had worked at painting for 40 years and had never been called upon to paint a brick wall, and I know from the tone of his letter that he is a practical painter. Penciling is very hard to do off of ladders, unless you rig a scaffold with them, which is done by standing two ladders alongside of the wall, lashing the tops to the cornice. Get a good stout plank and have one end on one ladder and the other end on the other ladder. The swinging scaffold is the best if you have one. For color use white lead, oil, and japs. enough to dry it, also turps. enough to keep it from running. If you are inexperienced in that class of work, commence at the back of the house, or do the chimneys first, and by the time you get around to the front your work will be better.

**Inside Work**

Is usually done in "flats," sometimes dead, sometimes eggshell. Whites I would recommend to work "dead," as they are less liable to turn yellow. But if you wish an eggshell finish put a little demar varnish in it; use no oil. It is not always advisable where tints are used to work the color "dead," for in that case more material is used, for the oil helps to make the body, consequently the material will go further. It is useless to enter into minute details as to how all the various kinds of inside work should be done, but will give my way of doing some of the more important kinds of work.

Gloss White, sometimes called porcelain white, Florence white, &c. It is useless to tell the practical painter that he should clean all the dust and dirt out of the room first, but it is necessary at times. I have known some of the best workman in the country to prime the work and then clean up afterwards, but by so doing, it causes more sandpapering and cleaning up to be done. I will now treat on how a first class job is to be done. This is a class of work that must not be hurried.

1st. Clean all the work. Get all the dust and dirt out of the room; do not leave a speck of dust on the work or floor; use a good, stiff bristle duster for that purpose.

2d. Coat the work with shellac varnish.

3d. Size all the knots and sappy places with quick drying gold size, then lay on a leaf of gold or silver. That is the only reliable way I have ever found of killing knots.

4th. Coat the work with white lead mixed with turps and oil, half and half. Give this coat a sufficient time to dry.

5th. The putty should be white lead, whiting and japan. Putty up all the hole, cracks, etc. Let the work stand until the putty begins to harden, then sandpaper all the work in the room, then dust off and sweep the floor. Right here let me say, some workman will rub down a door and frame, paint it, then go to the next and rub it down and dust it off, throwing dust all over the work they have just done, but that kind of work will not do.

6th. Coat the work with half white lead and half zinc, almost dead flat.

7th. This coat should be all zinc of the best

quality; French green seal is what I would recommend. Put it on with a soft hair flatting brush, and make it cover as well as you can. Work the color dead flat. This coat should be allowed to become hard

8th. Now all depends upon the judgment of the workman. The work must have a good clear white white body before it receives the final rubbing. If the work is not clear enough put on another coat of the same as the last, but not so heavy. Do not put that coat on until the work is thoroughly dry, then let the work get hard, the harder the better; then sandpaper, use No. 1. If the work is not dry it will roll under the paper, and also gum up. Rub all brush marks down smooth; be careful not to rub the edges bare, but if you do, touch them up with color.

9th. Eggshell gloss, that is zinc mixed with turps with one-half demar varnish. See that your color is clean, run through a fine strainer. Use well-ground Cal. Magnesia for dryer in this and the previous coats, except the first. Do not use japan as it is apt to stain the work.

10th. Rub down lightly with very fine

sandpaper. The work should be hard, the harder the better, for if it is anyways soft the varnish will go in dead and will necessitate one or more coats of demar.

The demar for this coat should be stained a little with the zinc, and should be flowed on quick. Look sharp for runs; if you see them start wipe them up before the varnish sets, for it you do not it will then be too late. I have put water in the varnish to prevent its running, but it is not advisable, as it does not do the varnish any good. It is sometimes necessary to give the work a second coat of demar, but do not do it until the previous coat is thoroughly dry, which will take about three days. If there are any runs cut them off with a sharp chisel or sharp putty knife.

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**Painting Plastered Walls.**

Walls that have never been painted should be thoroughly cleaned and rubbed down; then give them a coat of glue size, then putty up all the holes and cracks. The putty for that purpose is made of whiting and glue water. Use no oil In large holes when the putty is dry

you will have to re-putty, as it will shrink more or less. Avoid using oil putty in this class of work, as the putty is apt to strike through. For oil finish,—first and second coats half and half oil and turps, third coat all oil. If you have a bad wall or a rough ceiling I would advise you to stipple. It is very easily done. If you have no stippling brush a bristle dusting brush will do. Pounce each stretch as you do them with the point of the brush. You must be careful to pounce it all over evenly, and leave no holidays. Varnished ceilings and side walls are passing out of date. I do not advise them, for where you use zinc mixed with oil it is almost impossible for the inexperienced to tell the difference. But where it is necessary to have varnish finish, first coat should be almost flat; second coat two-thirds turps and one-third varnish; third coat half turps and half varnish, and for the last or varnish coat use almost clear varnish. Put enough color in it to stain it. The wall can be improved by running a stencil border around the room. I have patterns of all kinds for sale. Price 25 cents per pattern, or three for 50 cents. Send 1-cent postage

stamps. In ordering please state the size you wish. For further particulars see card in the back of this book.

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**Mould Stains.**

The spots should be well wet with cider vinegar. Let stand for a few hours, then wash with alum water. I have sometime shellaced the spots after the washing.

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**Stencil and Pounce Patterns for Walls, Ceilings, &c,**

For pounce, medium heavy roll drawing-paper is the best for ceiling, or where the pounce pattern is to be large, but any kind of thin, tough paper will answer.

TOOLS.—The straight edge, dividers, a few sticks of charcoal, (that made from grapevine is considered the best,) and a medium grade lead pencil, comprise the tools for sketching.

With the straight edge first draw two center lines, at right angles, across the paper, then on one side of center line sketch in one-half of the scroll or ornament, in a bold free off-hand manner, with charcoal. Trace these lines carefully with lead pencil, correct all curves or angles

where necessary. and dust off the charcoal. If the design proves satisfactory retrace the pencil marks with charcoal and fold the sheet inward on the center line; rub the paper lightly on the back and you have a faint outline of the other half of the design, which may be speedily completed with the lead pencil. Now don't grasp an old blunt pin and punch away at the design until it resembles a porous plaster, but procure a slim, sharp needle and shape a piece of soft wood about the size and shape of a sharpened lead pencil for a handle. By placing the point of the needle against some hard wood, the needle can be pressed into the handle. You can save time enough in pricking one good sized pattern to make a tool of this description, and with proper usage it will last a life time.

Pricking the pattern is an awkward job if held in the hands, and good work is rarely accomplished in that way. To do it neatly and easily, spread the pattern out on a smooth cloth cushion; but as cushions are unusual furniture for the paint shop and not always convenient to get, take the next best thing you can get hold of which may be a woolen jacket or even

an old pair of overalls rolled up into a suitable bundle.

If the needle be driven straight through into the cloth, it makes a clean-cut hole and the pattern will work equally well from the bottom side. Whiting tied up in some coarse thin cloth is most commonly used for a pounce bag, but for a light ground work use powdered charcoal.

A tracing wheel that pricks twelve holes to the inch, with long slim teeth is the best, and may be procured of any dealer in saddlery hardware. A smooth soft wood board is the best to brick on. Unfold the paper after pricking, and lightly sandpaper the reverse side to remove the raised portion forced through by the teeth of the wheel, which, if neglected, will obstruct the holes. Pounce with whiting. Rose pink is suitable for light colors.

### Stencil Patterns.

For stencil patterns use linen tracing cloth. The design may be drawn with lead pencil, and, with good taste and judgment, the ties may be so placed as to require no touching up or connecting. Cut on glass with a sharp pen-

knife held perpendicular or nearly so; this done, give two coats of shellac on each side and you have a pattern that will last a long time. It should be carefully cleaned after using. A great improvement in stencilling is the roller, which has superseded the stencil brush. A wooden roller 2½ or 3 inches long and 1½ inches in diameter is set in a forked handle and covered with ordinary car seat plush. The paint to be used should be made quite thick and sufficient oil used to prevent setting too quickly. Spread a small quantity of the color on a palette or sheet of glass, and run the roller several times over it. Care must be taken not to get too much color as it will press under the edges of the pattern and make an unsightly blot. Small patterns may be held in position with one hand, but larger ones will require to be fastened with a couple of needles or fine tacks. With a little practice the most beautiful clear-cut designs can be executed, and several colors employed.

A good working gold-size for stencilling is made of English varnish and japan gold size thickened with tube chrome yellow. Equally

clean work may be done with it as with paint. After using the roller, wash with benzine or turpentine and afterwards with soapsuds and rinse with clear water, and it is ready for use again. All colors for stencilling should be mixed with about as much turpentine as oil, and can be used very sparingly. A common mistake with the uninitiated is using the color too freely, which causes blots and ragged edges. To overcome this difficulty, I would recommend giving the brush or roller a few brisk rubs on a piece of board after it has been dipped in the color and before it is applied to the work. This will distribute the color evenly on the brush or roller and give uniformity of color and clear cut edges to the finished ornament.

I keep a large assortment of stencil patterns for fresco decorations, etc., comprising corners, mouldings, borders, brackets, center pieces, panels, pillasters, freizes, dados, &c. No two alike. 100 designs, (not cut,) full working size, artistically printed in colors, with full instructions, price $5 00. 1 sample for 25c., 3 for 50c. In ordering samples send 1-cent postage stamps.

**Paint for Tin and Iron Roofs.**

All fine preparations of the carbonates and oxides of lead or copper are unsuitable for painting tin roofs, for the reason that a PURE oxide when applied to other metals will assist in the action of the elements to oxidize the metals they cover. The vehicle of all good paint is boiled or raw linseed oil, and this, when thickened with pigments, covers a less given space; and the material being an oxide, holding more oil than is imparted to the surface to be painted, soon throws off its share and is ready to absorb the air and convey it to the body of the metal, where natural corrosion will take place, and then the two oxides unite chemically. In other words, all paints in the absence of a solvent, which time soon releases them of, act upon iron or tin as a filter, feeding the porous spots with moisture, like a porous plaster of rust; and as like produces its kind, the decomposed metals work like a happy family, and roll in beds of rust. This fact is observable on flat surfaces, or in gutters where inequalities occur. Here the fine dust or powder collects and keeps the water in them until

the oil decomposes, then the work of oxidation commences. There is another fruitful source from which rust on the upper or under side of roofing tin comes, and that is mixing paints in common, cheap oils of kerosene, containing sulphuric acid. This oil never dries. It may harden the film of paint so as to allow the acid it contains to corrode the tin, and the best paint in the world on the opposite side cannot prevent the acid-eaten holes from coming through; and judge the effect when both sides happen to receive the same potent mixture!

The best paint for tin or iron is composed of pure linseed oil and earth ochres, red or yellow. The coarser granulated powders are best as a pigment, as they offer less air holes and give a firmer hold for the oil on the grits, and thus bend them to the metal. The oil in this manner gets close to the metal, and offers resistance to the air in removing the atoms from its cohesion.

Roofing tin should, when laid, be kept clean from windfalls of dust, and painted once in every two or three years. Metals applied in

the angles of roofs as flashings, where shingles are laid behind parapet walls, should be well painted, on both sides, and the crevices between the laps puttied and painted, and thus cut off leaks in corners.

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### Varnishing.

In the proper manipulation of varnish lies to a considerable degree the secret of its presenting fullness and brilliancy. The same make of varnish applied by two different methods of brushing, will often present so great a difference in beauty as to give the impression that one body was finished with an A No. 1 grade, while the other will appear to be quite the opposite. Finishers who flow on heavy coats of varnish, and spread it over a considerable before they level it up—as a rule—produce the best work, and are the least liable to lay in complaints about seediness, brush marks and runs.

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### Fresco or Distemper Painting.

The carbonate of lime or whitening employed as a basis is less active than the pure lime of fresco. The vehicles of both modes are the

same and their practice is often combined in the same work. Water is the common vehicle, and to give adhesion to the tints and colors in distemper painting and make them keep their place they are variously mixed with the size of glue. Too much of the glue disposes the painting to crack and peel from the ground, while with too little it is friable and deficient of of strength. In some cases the glue may be abated or altogether dispensed with, by employing plaster of Paris sufficiently diluted and worked into colors, by which they will acquire a good surface and keep their place in the dry with the strength of fresco and without being liable to mildew, to which animal glue is disposed, and to which milk and other vehicles recommended in this mode are subject. Of more difficult introduction in these modes of painting is beeswax, although it has been employed successfully in each of them, and in the encaustic of the ancients who finished their work therein by heating the surface of the painting till the wax melted. That would be rather a slow process for the present day.

Never work the color while warm, and do

not dissolve the glue by means of heat if it can be avoided. The brushes for this class of work should be first class long bristle brushes. The stencil is very extensively used in this class of work; handwork, according to the prices that are now paid does not pay. It is so now that any one that can draw a straight line, and has a set of stencils—that person is a fresco painter.

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**Measurements.**

OUTSIDE WORK.—To get at the number of yards there are of wall or weatherboard I would suggest the following method: Add the number of feet front and rear to the feet in length (both sides) Multiply this by the average hight. Divide the product by 9, which will give the number of yards to be painted.

| | |
|---|---|
| FOR EXAMPLE—Front | 30 feet |
| Rear | 30 " |
| Side | 40 " |
| Side | 40 " |
| | 140 |
| Multiply by average height | 25 |
| | 700 |
| | 280 |
| | 9)3500 |
| Square yards | 389 |

In some sections it is not customary to count in windows and doors solid. The painter should have extra for all outside doors and windows. Windows will average three yards; doors and casings five yards. If you think you can do the work for twenty cents per yard, the windows would be sixty cents apiece, then multiply by the number of windows. The door would be $1, which also multiply by the number of doors.

Cornices should be measured $1\frac{1}{2}$ times for the girth if it is plain and one color; but if more than one color, one girth for each additional color. The measurer must make allowance for the position of the cornice, if it is a hard one to get at allow for it accordingly.

Cornice with blocks—two girths.

" " and brackets, — if the brackets are not very close together give it two and a half girths.

Cornice with blocks, brackets and molded panels,—three girths.

—

Barge boards, if 6 inches wide, should count one foot.

Corner strips, carpet strips, hook strips, gas and other pipes, should count as one foot.

Edges of shelving one foot.

Blinds, the height one time, width three times.

Lattice, height one time, width four times.

Scroll work on verandas should be measured solid for each side.

Sash solid for each side.

Cutting edges of all descriptions inside and out four inches.

Cupaloes and other high work should have double measurement.

Weatherboard edges should be counted 1 inch.

Base board from 5 to 8 inches should count as one foot.

Capped base, one and one-half foot; with two colors if 10 inches, 2 feet; if over 10 inches more in proportion.

Fencing should be counted solid on both sides.

Picket fence, 4 feet high, one yard to the foot.

Iron fence, 3 feet high, one yard to the foot.

**Bill of Prices for Painting, &c.**

New work, and furnish material.

Surface work, square yard, 1 coat.....10c
" " 2 " ..... 18
" " 3 " .....25
Brick walls, " 1 " .....15
" " 2 " .....25
" " 3 " .....35

Varnishing same as painting.

OLD WORK.

Surface work, square yard, 2 coats.....18c
Brick wall, " 2 " .....20
" penciling, sq. yd.,.....10
Ground, graining, and 1 coat of varnish, square yard.....60
Graining.....35

GLAZING.

Priming and glazing sash, glass 10 inches in length..... 5c

Add 1 cent for each 2 inches up to 24, after which add 1 cent for every inch. Bedding and back-puttying charge double rates. When putty is of a different color charge in proportion to the extra labor, which is generally one-

half more. If the painter furnishes the glass charge 10 per cent. of cost for breakage.

RE-GLAZING.

Charge the same for the labor that the glass costs.

Plain lettering on board, per foot.....20c
Shaded, one color, " " .....25
For each additional color, " ..... 5
Plain lettering on muslin, " .....10
" on wall, " .....18
Large lettering " " .....25

Charge for the ground by the square yard.

Gold lettering on board, small, per foot.....50c
" " over 6 in., " .....60
" flock or smalt, " .....75
" on glass, small, " .....60
" " large, " .....75
" " shaded, " .....80
" " blend shade,..$1.00 to 1.25
Gilding, per book.....50c

A book of gold has 25 leaves in it, $3\frac{1}{2}$ inches square or $12\frac{1}{2}$ square inches, or 318 inches to the book. A gold gilder will make it reach 310 on flat work. Sign work, 300; there being

so much more waste in that class of work. It is always best to count the leaf 9 inches and allow the ½ inch for waste

1 paper of bronze will go over 4 square feet.
1 pound of flock will cover 5 yards.
1 " " smalt " 1 yard.

CARRIAGE PAINTING.

New buggy, plain finish,..... .....$15
" fine finish, .....$18 to $25
New carriage, plain finish..... .....$20
" fine finish.....$25 to $35
Spring wagon, new, plain finish.....$12
" " fine finish.....$15 to $25

For old work, one-fourth less than new.

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**Contracting.**

There are times that the painter cannot go all through a house and measure everything in it that is to be painted. I have made bids on work and never seen the house inside of ten minutes. The method I have is to average all inside work thus: 1 side of door and frame, 1 side window and frame, 1 base board, 1 mantel. If they are all measured up the average will be 5 yards apiece; at 20c. per yard would be $1.

half more. If the painter furnishes the glass charge 10 per cent. of cost for breakage.

RE-GLAZING.

Charge the same for the labor that the glass costs.

Plain lettering on board, per foot.....2Cc
Shaded, one color, " " .....25
For each additional color, " ..... 5
Plain lettering on muslin, " .....10
" on wall, " .....18
Large lettering " " .....25

Charge for the ground by the square yard.

Gold lettering on board, small, per foot.....50c
" " over 6 in., " .....60
" flock or smalt, " .....75
" on glass, small, " .....60
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Count the number of sides and multiply by $1 and you will have the cost of all the work.

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**Weights and Measures of Paints.**

The figures here given are the results of careful experiments, and will prove as nearly right as it is possible to make them:

WEIGHTS.—Turpentine, 1 gal., weighs 5 lbs.
Varnish, " " 8 lbs.
Linseed Oil, " " 7½ lbs.
Japan, " " 9 lbs.
Pure Lead mixed, " " 20 lbs.

PRIMING WOODWORK.

1 lb. of pure lead will prime.....4 sq. yds.
" adulterated lead " .....5½ "
" substitute " " .....8 "
" ochre " .....7 "

PRIMING BRICK WALL.

1¼ lb. lead will prime.....1 sq. yd.
The other paints the same in proportion.

On plastered walls you can calculate on the material going 1¾ times as far as on woodwork, and if the wall is hard finish it will go still farther. 5 lbs. substitute will finish a ceiling 15x15, giving it three coats, and you will have

a much better job than if you use lead.

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## MEDICAL DEPARTMENT.

Iodide of Potassium, one-half ounce,

Syrup of Sarsaparilla, six ounces,

Mix, and take one teaspoonful four times a day.

The above recipe is one used by the entire profession as a cure for "lead poisoning," and is considered the best in use by the most eminent authors. It is a well-known fact that lead poisoning is exceeding hard to control, from two reasons: first, it is most insidious in its approach, and has thoroughly pervaded the system before the unfortuate victim is aware of its existence; and, secondly, it is like the chains of malaria, the victim must either give up his trade or be constantly exposed to the cause of his malady. For the prevention of the poison I would recommend first of all cleanliness in every particular; regular baths in cold water; the avoidance of too-constant wearing of the clothes saturated with the lead; the working

in close shops. A close attention should be paid the diet, the bowels kept regular, and open air exercise should be constantly observed. A painter who makes his trade a life-work should leave his shop at intervals, not too far apart, and remain away from the poison long enough each time for his system to free itself from any invasion that has already been made, and I feel quite sure that if the above observations be strictly followed there will be no "painter's colic."

It is impossible to treat any especial case without its history, and will, therefore, say if any individual wants special treatment it can be obtained by sending the symptoms and duration of the attack, as plainly as you can, together with $2 00, to my address,

G. W. PRUGH, M. D.,

Greene Co. XENIA, OHIO.

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I have now an article that the Painter has long felt the need of:

## TRANSFERABLE STENCIL PATTERNS.

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**Coach, Sign, and**

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One set of Transfer Stencil Patterns will do for ordinary work. The patterns will enable the House-Painter to do a good job of Fresco Work.

—

DIRECTIONS.—After preparing the paper as described in a previous article, lay the pattern on the prepared paper and run a warm iron over it. Five or six impressions can be made off of the same pattern.

—

—TERMS.—

1 sample pattern..... .25
3 " " ..... .50
1 complete set of 100 patterns, no two alike.....$5.00

—

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